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INDEX TO VOLUME LVII

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INDEX TO VOLUME LVII

In the lists below, the number first mentioned identifies the month of issue.

AUTHORS' INDEX

Anderson, Dale W.	1-38
Ashley, Byron J.	6-350
Bair, Albert E.	2-65
Brandmeyer, Robert C.	2-96
Brown, Robert W.	3-170
Brown, William	12-756
Byrne, Margaret C.	7-413
Budetti, Joseph A.	2-59
Butcher, Thomas P.	6-338
Calkins, Graham	9-538
Capos, Nicholas J.	11-679
Collins, Dean	7-436
Crow, Ernest W.	5-269
Davis, Donald R.	5-275; 10-619; 12-756
DeBoer, Arthur	9-545
Delp, Mahlon	9-538
Dimond, E. Grey	9-551; 12-762
Dougherty, Thomas M.	5-304
Elkin, Miriam Tate	7-413
Evans, Grant E.	5-269
Fitts, William T., Jr.	9-545
FitzPatrick, Martin J.	8-473
Foster, Thomas L.	7-410
Francisco, W. David	7-413
Fulton, John K.	1-1; 5-267
Graham, Kenneth L.	10-624
Greenhouse, Arnold H.	10-611
Grimshaw, John A.	11-687
Grove, John A.	6-336
Hensley, Cline D., Jr.	10-625
Hiebert, A. E.	6-344
Jackson, George W.	1-4
Jewell, Ross L.	10-644
Joseph, Bruce	11-714
Keetle, William C.	12-760
Marshall, Victor F.	9-545
Mayo, Charles W.	5-275
McConchie, James E.	10-624
McDonald, John R.	9-545
Menaker, J. S.	4-202
Morgan, J. L.	1-4
Norris, Robert P.	7-407
Olson, John E.	12-
Omer, George E., Jr.	11-683
Paine, John R.	9-545
Peterson, R. E.	9-582
Pokorny, Charles	7-410
Reals, William J.	2-65
Reed, D. Cramer	8-482
Robinson, David W.	9-545
Rombold, Charles R.	7-403; 8-467; 9-535; 10-625
Roofe, Paul G.	11-690
Rosi, Peter A.	11-679
Seydell, Ernest M.	2-59
Shellito, John G.	4-199; 5-267
Snodgrass, R. Glenn	6-382
Speirs, Richard E.	6-340
Stout, James Murray	8-499
Struxness, E. B.	8-480
Taylor, C. F.	1-4
Throckmorton, Marion A.	2-68
Tocker, Alfred M.	2-62; 5-269
Tucker, Virginia L. E.	5-279
Wagner, Frederik F.	1-6
Walker, Jack D.	12-749
Wedin, Paul H.	2-65
Wellman, Garland O.	1-10
Wier, Charles K.	6-342
Williamson, William P.	6-348
Wright, William T., Jr.	7-410

INDEX TO SUBJECT MATTER

Abdomen: management of trauma to	6-340
Abnormalities	
congenital megacolon (C.P.C.)	5-288
iniencephalus	11-690
pyloric stenosis, surgical treatment of	10-619
Agammaglobulinemia: case report and survey of literature	10-611
Alseroxylon: (see Tranquilizing drugs)	
Amyloidosis: (C.P.C.)	2-75
Aneurysms: dissecting, in ascending aorta (C.P.C.)	7-420
Asthma: khellin in treatment of	1-1
Biopsy: role of in spread of cancer (panel)	9-545
Blood dyscrasias: thrombocytopenic purpura	7-407
Brain	
encephalitis, eastern equine (C.P.C.)	11-696
encephalomyelitis in United States	1-38

epilepsy	
history of folklore in treatment of	5-304
psychomotor	2-96
injuries of	
internal carotid artery, spontaneous thrombosis of ..	6-382
intracranial tumors encountered in psychiatric clinic ..	1-6
meningioma (tumor conference)	10-636
micotic granuloma of meninges and lungs (C.P.C.) ..	9-564
Breast: inflammatory lesions and tumors of	1-10
Brinkley, John R.: The Goat Gland Surgeon	12-749
Burns: treatment of	6-344
Cancer	
basal cell carcinoma of the lower lip (tumor conference)	1-25
of colon	11-679
lymphosarcoma, treatment of three cases in stomach ..	4-199
of penis	8-482
of rectum and colon, with special reference to precursory lesions	5-275
seminoma, retroperitoneal, of testis (tumor conference)	3-164
Cerebral palsy: at University of Kansas Medical Center Clinic	7-413
Chest	
lungs	
Dionosil in bronchography	2-62
diseases in our aging population	8-473
mycotic granuloma of lungs and meninges (C.P.C.) ..	9-564
pleura: solitary mesothelioma of	2-65
Chlorpromazine (see Tranquilizing drugs)	
Clinicopathological conferences	
amyloidosis	2-75
aneurysm, dissecting, of the ascending aorta	7-420
encephalitis, eastern equine	11-696
megacolon, congenital	5-288
mycotic granuloma of lungs and meninges	9-564
Colon and rectum	
cancer of, with special reference of precursory lesions	5-275
carcinoma of, selection of operations for	11-679
Dionosil: in bronchography	2-62
Diverticulum of duodenum: intestinal obstruction caused by	8-480
Electrocardiograph: telephone diagnosis of heart disease	1-4
Emergency room care	6-338
Encephalitis: eastern equine (C.P.C.)	11-696
Encephalomyelitis: in United States	1-38
Epilepsy	
history of folklore in its treatment	5-304
psychomotor	2-96
Excretion tests: in diagnosis of stomach disorders	10-644
Eye	
malignant melanoma of the conjunctiva (tumor conference)	12-775
treatment of trauma to	6-350
Fractures	
of lower extremity	6-342
restoration of function after ... 7-403; 8-467; 9-535; ..	10-625
Gamma globulin: deficiency of	10-611
Genitalia	
penis: erythroplasia of Queyrat progressing to carcinoma	
of	8-482
spermatic cord: fibroma of	2-68
testis: retroperitoneal seminoma of (tumor conference)	3-164
Geriatrics: pulmonary diseases in aging population	8-473
Goat gland surgeon: John R. Brinkley	12-749
Head: (see Brain)	
Heart	
cardiovascular laboratory, University of Kansas Medical Center	9-551
failure, blood ammonia levels in congestive	9-538
Kaw Valley Heart Association	12-762
mitral commissurotomy during pregnancy	5-267; 5-269
rheumatic lesions, experimental production of, in hearts of animals	5-279
telephone electrocardiograph in diagnosis of diseases of	1-4
Hernia: surgical repair of huge inguinoscrotal, in one-stage procedure	12-756
Inflammation: lesions in breast due to	1-10
Iniencephalus: description and case of	11-690
Intestinal obstruction: produced by diverticulum of duodenum	8-480
Intracranial tumors: in psychiatric clinic	1-6
Kaw Valley Heart Association	12-762
Khellin: in treatment of asthma	1-1
Lip: basal-cell carcinoma of (tumor conference)	1-25
Magnesium: its role in metabolism	3-170
Megacolon: congenital (C.P.C.)	5-288
Mental disease: surgical treatment in	7-436
Mitral commissurotomy: during pregnancy	5-267; 5-269
Mycotic granuloma: of lungs and meninges (C.P.C.) ..	9-564
Neck: vascular tumors of (tumor conference)	8-489

INDEX TO VOLUME LVII

In the lists below, the number first mentioned identifies the month of issue.

Obstetrics	
fetal death caused by knot in cord	4-202
training for	12-760
Otitis: catarrhal	2-59
Pancreas: islet cell tumors of (tumor conference)	6-356
Plaster casts: application of	11-683
Pregnancy	
ectopic, review of literature and case reports	8-499
mitral commissurotomy during	5-267; 5-269
Purpura, thrombocytopenic: clinical aspects of	7-407
Rectum: (<i>see</i> Colon and rectum)	
Rehabilitation: after fractures	7-403; 8-467; 9-535; 10-625
Reserpine: (<i>see</i> Tranquilizing drugs)	
Rickets, hypophosphatemic: description and case reports	9-582
Stomach	
excretion tests in diagnosis of diseases of	10-644
lymphosarcoma, treatment of	4-199
pyloric stenosis, surgical treatment of	10-619
trichobezoar, surgical treatment of	10-624
Tranquilizing drugs	
alseroxylon	7-410
chlorpromazine	11-687
reserpine	11-687
Trauma	
plaster casts as splinting agents	11-683
restoration of function after	
fractures	7-403; 8-467; 9-535; 10-625
symposium on	
abdominal injury	6-340
burns	6-344
emergency room care	6-338
fractures of lower extremity	6-342
head injuries	6-348
ocular emergencies	6-350
transportation of injured	6-336
Trichobezoar: report of case involving stomach, duodenum, and jejunum	10-624
Tumor conferences	
basal-cell carcinoma of lower lip	1-25
islet cell tumors of pancreas	6-356
malignant melanoma of conjunctiva	12-775
meningioma	10-636
retroperitoneal seminoma	3-164
vascular tumors of the neck	8-489
Tumors	
basal-cell carcinoma of lower lip (tumor conference)	1-25
of breast	1-10
fibroma of spermatic cord	2-68
intracranial, in psychiatric clinic	1-6
melanoma, malignant, of conjunctiva (tumor conference)	12-775
meningioma (tumor conference)	10-636
mesothelioma, solitary, of the pleura	2-65
of pancreas, islet cell (tumor conference)	6-356
seminoma, retroperitoneal, of testis (tumor conference)	3-164
vascular, of the neck (tumor conference)	8-489
University of Kansas Medical Center	
cardiovascular laboratory, activities of	9-551
cerebral palsy, study of	7-413
department of anatomy	3-127
department of biochemistry	3-128
department of medicine	3-128
department of medical microbiology	3-130
department of obstetrics and gynecology	3-133
department of ophthalmology	3-134
department of otorhinolaryngology	3-135
department of pathology and oncology	3-135
department of pediatrics	3-136
department of pharmacology	3-139
department of physical medicine	3-139
department of physiology	3-141
department of postgraduate medical education	3-142
department of psychiatry	3-144
department of public health and preventive medicine	3-148
department of radiology	3-148
department of surgery	3-150
outline of facilities, policies, accomplishments, objectives	3-123

EDITORIALS

American Association of Medical Assistants	12-770
Care for Military Dependents	10-631
Chaplain and Medicine, The	9-558
Code of Ethics	7-417
Diabetes Week-November 11 to 17, 1956	11-694
Fatal Fallacies	6-353
Federal Health Expenditures	12-771
Free Public School, The	5-285
Hospital Accreditation	7-417
JOURNAL Grows, The	10-631
JOURNAL Style	8-487
Leading Causes of Death	11-694
Life Insurance	6-354
Longevity in Kansas	1-20
Medical Education Contributions	1-20
Medical History	5-285
Medicare	12-767
Opposition to HR 7225	5-285
Our Centenarian, Dr. George M. Gray	2-71
Preceptor Program, The	3-159
Reducing the Budget	2-71
Referrals to K.U.M.C.	1-19
Refresher Courses Tax Deductible	8-488
Rural Health	11-693
Rural Health Conference in Kansas	10-634
School of Medicine Issue	3-159
Science Fairs	2-72
Standard Medical Report	11-693
Survey of Hospital Facilities	8-487
Tetanus in Kansas	6-353
What's Wrong with Medical Organizations	9-557
Workmen's Compensation	1-21

DEATH NOTICES

Ashley, Dr. Samuel Glick	11-708
Bell, Dr. Perry Marshall	11-708
Beverley, Dr. George William Bartram	11-708
Borst, Dr. William Lewis	2-86
Brethour, Dr. George E.	12-772
Clark, Dr. Dale E.	7-428
Clayton, Dr. Ione Schultz	11-708
Clutz, Dr. Ralph R.	1-36
Coburn, Dr. Clay Ephraim	7-428
Conover, Dr. Estella Edwards	6-363
Earp, Dr. Ralph Bowman	8-497
Gloyne, Dr. Louis Boucher	1-36
Gray, Dr. Albert Newton	11-708
Hibbler, Dr. John Arthur, Jr.	5-300
Ireland, Dr. Edwin McCormick	2-86
Jordan, Dr. Ralph Ensign	8-497
Kennedy, Dr. John T.	2-86
Laing, Dr. Stanley Glen	7-428
Leiker, Dr. Raymond Joseph	1-36
Lerrigo, Dr. Charles Henry	1-36
McCreight, Dr. Marlin Samuel	3-166
McGrew, Dr. John Merritt	9-578
McIlhenny, Dr. Robert Campbell	3-166
McKinley, Dr. Walter Etna	9-578
Miller, Dr. Bert Elba	1-36
O'Donnell, Dr. Alfred	8-497
O'Donnell, Dr. Frederick William	12-772
Orr, Dr. Thomas Grover	1-36
Pettersen, Dr. Edward Chester	2-86
Schoor, Dr. William Frederick	8-497
Shelley, Dr. Robert A. J.	8-497
Sudler, Dr. Mervin Tuban	8-497
Von Trebra, Dr. Robert L.	5-300
Wahl, Dr. Harry Roswell	7-428
Weaver, Dr. James Branson	6-363
Wessell, Dr. Maurice S.	5-300
Williams, Dr. Donald L.	9-578



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TABLE OF CONTENTS

JANUARY, 1956

Scientific Articles

The Use of Khellin in Bronchial Asthma— John K. Fulton, M.D., Wichita, Kansas . . .	1
A Practical Application of the Telephone Electrocardiograph—George W. Jackson, M.D., Topeka, Kansas; C. F. Taylor, M.D., Norton, Kansas, and J. L. Morgan, M.D., Emporia, Kansas	4
Intracranial Tumors in a Psychiatric Clinic— F. F. Wagner, M.D., Topeka, Kansas . . .	6
Diseases of the Breast: A Clinicopathological Review—Garland O. Wellman, M.D., Texas City, Texas	10

Tumor Conference: Basal-Cell Carcinoma of the Lower Lip	25
Senior Thesis: Encephalomyelitis	38

Editorials

Referrals to K.U.M.C.	19
Medical Education Contributions	20
Longevity in Kansas	20
Workmen's Compensation	21

Miscellaneous

President's Page	18
Just Browsing	24

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Volume LVII

JANUARY, 1956

No. 1

Asthma

The Use of Khellin in Its Treatment

JOHN K. FULTON, M.D., *Wichita*

Since the original publication by Anrep¹ in 1947 on the pharmacologic properties of the alkaloid khellin (visammin), reports have been controversial concerning the use of this drug in angina pectoris and bronchial asthma. Under laboratory conditions it has both coronary vasodilator and bronchodilator properties. However, the drug often produces severe nausea when taken orally and is moderately cumulative in action.

Initial results as reported by Major² were impressive in a series of 12 patients. Rosenman³ studied 21 patients, nine of whom showed prompt relief of asthma attacks after a single intramuscular injection of khellin. More impressive perhaps was the effect he observed in treating eight patients with chronic cor pulmonale, all of whom obtained a response described as "excellent." In three of these, the clinical response was accompanied by rapid loss of edema, which previously had been refractory to digitalis and diuretics.

Employing pulmonary function measurements, including maximum breathing capacity and vital capacity measurements in asthmatic patients before and after oral and intramuscular administration of khellin, Snider⁴ concluded that no significant bronchodilator effect could be demonstrated; however, in three of seven patients treated by the oral route there was a 20 per cent improvement in maximum breathing capacity, a difference they did not feel to be significant.

Silber⁵ noted no benefit from intramuscular khellin in six patients with chronic pulmonary insufficiency without asthma. With oral khellin, which may have

a cumulative effect, he noted an increase in maximum breathing capacity without consistent change in oxygen uptake, oxygen removal, cardiac output, or pulmonary arterial pressure. Cash and Zimmerman⁶ were unable to demonstrate any change in pulmonary arterial pressure or cardiac output in five patients with pulmonary hypertension given intramuscular and oral khellin.

Tuft⁷ injected 50 to 100 mgs. of khellin intramuscularly and reported appreciable degrees of benefit in 28 of 37 patients with chronic bronchial asthma who received more than one injection of crystalline khellin. Kenawy⁸ noted complete relief of acute attacks in 102 of 138 patients and partial relief in 24 following intramuscular khellin.

It would seem from the foregoing controversial data that khellin lacks the reliability and freedom from toxic effects which would make it desirable in the routine treatment of bronchial asthma. The author's experience would tend to indicate that for the average case of bronchial asthma, ephedrine, aminophylline, epinephrine, iodides, and isuprel are far

SUMMARY

Khellin (visammin) possesses distinct value in certain cases of bronchial asthma not responding to other forms of therapy.

Response to this drug is unreliable and gastrointestinal side effects are common. It is not recommended for routine treatment of chronic asthma.

The suggestion is made that khellin acts through an unknown mechanism to relieve certain types of asthma.

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more practical and dependable in the symptomatic treatment of asthma. In the usual severe case, cortisone and its analogues are entirely adequate within safe dosage ranges for prolonged administration.

There remains, however, a small but troublesome group who do not get complete or adequate relief from cortisone in dosages considered safe or desirable for prolonged administration. There are a few patients who seem refractory to cortisone or corticotropin in any dosage, particularly those with longstanding asthma and associated emphysema. The cases presented below were selected because these patients were not amenable to any other known type of therapy and appeared to be examples of the employment of khellin where it was not only useful but actually essential to the favorable outcome. These case studies were not "controlled" except that in each case failure of previous treatment led to a successful trial with khellin and reluctance on the part of the patient to discontinue its use.

CASE I

A 51-year-old white male had begun to have chronic cough during adolescence which developed into distinct asthma at the age of 41. This was complicated by suppurative bronchitis and the development of severe pulmonary emphysema. Scratch tests performed in 1952 were entirely negative. At about that time he first developed signs of cor pulmonale with hepatomegaly, ankle edema, moist pulmonary rales, marked cyanosis, and secondary polycythemia. The hematocrit was 62 per cent.

Response to repeated intravenous infusions of ACTH and to oral cortisone was poor. The edema became progressive and extended to the waist line, associated with massive hydrops of the scrotum. The patient was extremely cyanotic, drowsy, and apparently terminal. He was then given khellin in a dosage of 40 mg. orally four times daily. In three weeks a marked diuresis occurred with disappearance of most of the peripheral and pulmonary edema so that ambulation became possible. Improvement has been slowly progressive in the past two and one-half years, and the hematocrit is now 51. The patient is able to walk two city blocks without difficulty. There is no cyanosis. There is occasional slight wheezing which is relieved by isuprel inhalations.

Summary: This patient had failed to respond to cortisone, aminophylline, intravenous ACTH, potassium iodide, and isuprel, as well as to a low sodium diet, digitalis, and mercurial diuretics. Relief was prompt and lasting with oral khellin in a dosage of 40 mg. four times a day which he has continued for two and one-half years.

CASE II

A 47-year-old man had onset of nasal polyposis at the age of 41 followed by cough, wheezing, and

eventually attacks of severe intractable asthma which were not relieved by epinephrine. ACTH in an intramuscular dosage of 20 mg. every six hours gave only partial relief. Attacks were consistently produced by the ingestion of aspirin. He was then given cortisone in a dosage of 200 mg. daily which was later reduced to 75 mg. He was unable to obtain complete relief with the latter dosage.

After moving to Tennessee in 1951, he received desensitization treatments for six weeks for bacteria and dust without relief. He then visited an asthma clinic in Mississippi in October of 1952 and continued its medication until January of 1953. During this period he also saw two different psychiatrists, received a course of roentgen therapy to the chest, and had six nasal polypectomies in the two-year interval. His longest period of relief without cortisone was two and one-half months.

When he returned in 1954, he required frequent daily injections of epinephrine and had lost two good jobs because of his chronic illness. He was then given khellin in a total dosage of 240 mg. per day. He has now received this medication for one and one-half years. In addition, he takes 25 mg. of cortisone two or three times daily. An attempt to reduce the dose of either khellin or of cortisone resulted in a slight increase of symptoms. He has lost no time from work in the past one and one-half years. Very small nasal polypi were present on his last examination.

Summary: An aspirin sensitive asthmatic, not controlled by 75 mg. of cortisone or by other specific or non-specific measures, was rendered essentially symptom-free by the combination of khellin and cortisone in moderate dosage.

CASE III

A 61-year-old white male had had asthma since World War I. He had had a period of partial relief for a few months following a visit to an asthma clinic in Mississippi. The asthma was non-seasonal and had not responded to desensitization therapy administered elsewhere. The asthma did not improve on an elimination diet, and relief had been only partial from Meticorten in a dosage of 10 mg. four times a day. He was given khellin in a dosage of 40 mg. four times a day and has continued it for a period of four months. He has had no attacks of asthma since beginning khellin therapy. He no longer uses either epinephrine or other symptomatic medications.

Summary: A patient with moderate, chronic, bronchial asthma was unrelieved by hyposensitization, food elimination, Gay treatment, and Meticorten. He obtained complete relief with oral khellin alone.

CASE IV

A 48-year-old white male had had asthma for five

years at any time of the year. Attacks were not characterized by severe paroxysms, but he considered himself mildly asthmatic at all times. Physical examination on numerous occasions confirmed this impression. Treatment with cortisone in a dosage of 25 mg. four times a day, ephedrine, iodine, aminophylline, and intramuscular ACTH did not relieve his attacks. He was then given khellin in a dosage of 40 mg. four times a day, which he has continued to take for the past four months.

Summary: Mild chronic, intrinsic, bronchial asthma was unrelieved by cortisone, ephedrine, and iodine. Complete relief occurred with khellin alone.

CASE V

A 49-year-old white male began to have asthma at age 43. He had been unrelieved by iodine, ephedrine, and mold desensitization. Relief was definite with khellin for a period of one and one-half years. There was then a gradual return of asthma which responded promptly to cortisone in a dosage of 75 mg. per day, but returned on a dosage of 50 mg. daily. He then consented to take both khellin and cortisone in dosages of 160 mgs. and 50 mgs. per day, respectively. On this regimen, he has been essentially free of asthma for eight months.

Summary: Mild, recurrent asthmatic attacks were controlled on combined khellin and cortisone therapy. The use of khellin permitted a reduction in cortisone dosage.

CASE VI

A 29-year-old white male had had asthma for one year. Attacks were possibly precipitated by aspirin but were non-seasonal and often severe. Scratch and intradermal skin tests to foods and inhalants were not informative. He obtained moderate improvement with potassium iodide, but he had nightly attacks of asthma requiring epinephrine. He was then given khellin in a dosage of 40 mg. four times a day. Relief was prompt and has lasted 18 months.

Summary: A patient with bronchial asthma and possible aspirin sensitivity had sustained relief with khellin alone.

COMMENT

Several tentative impressions were formed from the results in these cases and in others where the drug was used but seemed to make no useful contribution to therapy. The drug seemed most valuable in patients with longstanding, chronic disease, was in all of the most strikingly successful cases employed in the male sex, and was beneficial in cases commonly considered to be of the intrinsic type. Five of the six benefited patients were past 40, and most of these had noted onset of asthma after the age of 40. Obviously this series is too small to justify definite conclusions. These cases are presented as a suggestion of the probable sphere of usefulness of this drug in other cases.

The irregularity of clinical response to khellin suggests that its mechanism of action may be other than that of a simple bronchodilator. It has been useful where conventional bronchodilators and anti-inflammatory agents, such as cortisone, have been ineffective. This suggests that khellin acts by a different mechanism to relieve asthma.

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Eighth Annual Mid-West Cancer Conference

BROADVIEW HOTEL, WICHITA

MARCH 22 AND 23, 1956

Sponsored by Kansas Division, American Cancer
Society, and Committee on Control of Cancer,
Kansas Medical Society.

List of guest speakers will be announced in future issues of the Journal.

The Telephone Electrocardiograph

The Practical Application of an Ingenious Device

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Norton, and J. L. MORGAN, M.D., *Emporia*

The transmission of electrocardiograms over standard telephone wires has been widely described by the lay press as an eye catching and interesting development in the field of medicine. We would like to report our application of this principle as a practical and valuable time saving device connecting the Kansas State Tuberculosis Sanatorium in Norton with its consultant in cardiology in Emporia, 307 road miles east of the sanatorium.

The idea of sending electrocardiograms over telephone wires is not a new one. It has recently been recalled that William Einthoven used this method some 50 years ago to transmit electrocardiograms from in-patients in the hospital to his non-portable string galvanometer in the laboratory building located some distance from the hospital.⁶ Einthoven called his remotely obtained tracings "telecardiograms." The presently used device has been termed the "Tele-EKG."⁴

The practicality of sending electrocardiograms instantaneously from the bedside via telephone wires to a *distant* consultant was established in this country by Dimond at the University of Kansas^{1, 2, 3, 4} and Rahm and associates at the University of Nebraska in 1952.^{8, 9} They incorporated the use of a small preamplifier which is connected to the patient and converts the electrocardiographic voltages into a frequency modulated signal. This is transmitted over the telephone lines and is demodulated at the receiving end where it can be recorded on tape, viewed on the cathode ray screen, or recorded on any standard electrocardiograph.

The applicability of this system is not confined to the transmission of electrocardiograms alone, since electroencephalograms can be similarly sent.⁷ The frequency modulation feature has been carried a step beyond the telephone limitations and has even been adapted to the wireless transmission of electrocardiograms from an airplane to the ground⁵—though this obviously seems to be of experimental interest.

In October, 1952, we began investigating the feasibility of a Tele-EKG system for the Kansas

State Tuberculosis Sanatorium. This institution, located at Norton, a town of 3,000 inhabitants, has 500 beds which are occupied in their entirety much of the time. The problem of adequately staffing the sanatorium with physicians is no different from that problem in all similar institutions, in that there is a rather frequent turnover of at least half of the staff physicians. From time to time able cardiologists have been on location at the sanatorium; however, there were gaps in the continuity of this coverage, so a consultant was appointed several years ago to insure a long time follow-up of the cardiac problems.

As a part of this service, electrocardiograms were sent by mail to Emporia, taking a minimum of four days in the mail for the round trip. Many of these were not of an emergency nature, but a sufficient number were of immediate interest to prompt the time saving consideration of the Tele-EKG. Finally, on February 8, 1954, the Southwestern Bell Telephone Company gave approval for the use of their lines for our transmission circuit, and on April 15,

SUMMARY

The telephone electrocardiograph has been an accurate and practical diagnostic device as used between the State Tuberculosis Sanatorium at Norton, Kansas, and Emporia, Kansas, over a period of a year and a half.

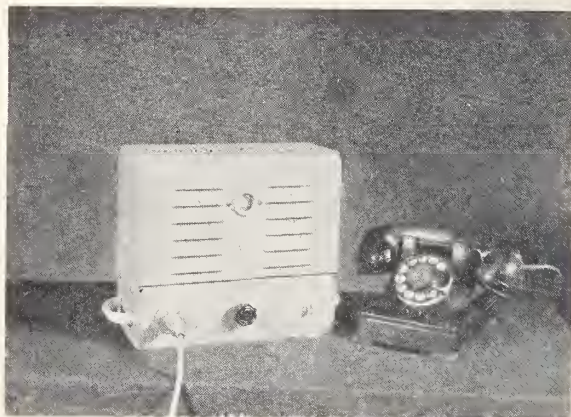


Figure 1. The sending unit of the telephone electrocardiograph.

Dr. Jackson is Director of Institutional Management, Kansas State Department of Social Welfare; Dr. Taylor is superintendent of the Kansas State Tuberculosis Sanatoria; Dr. Morgan is consultant in cardiology, Kansas State Tuberculosis Sanatoria.

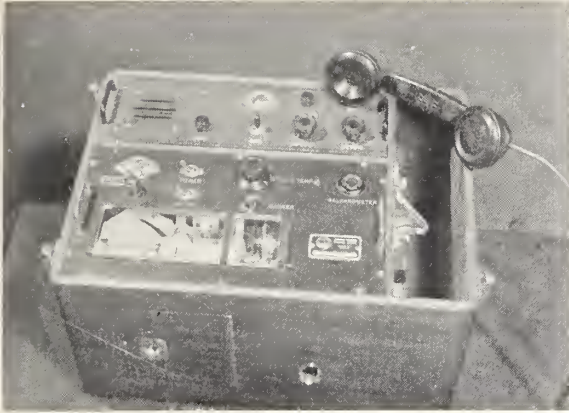


Figure 2. The receiving unit of the telephone electrocardiograph.

1954, we installed the first Tele-EKG made commercially following the design of Doctor Dimond's experimental apparatus.*

The actual operation of the apparatus is easily mastered. One technician from the sanatorium and one from Emporia were instructed in one day's time to respectively send and receive the Tele-EKG (See Figures 1 and 2). The expense of operating the Tele-EKG, once installed, is reasonable. The telephone rates are standard for station to station calls. For the Norton-Emporia connection, which covers 229 air miles which is the way telephone mileage is calculated, the rate is a dollar for the first three minutes and thirty cents for each succeeding minute until 16 minutes, after which time the rate is even less. It takes about three minutes per tracing, so this is approximately \$1.00 per patient tracing.

Since April, 1954, we have transmitted electro-

cardiograms at least once weekly, and we have had no technical interference from the apparatus. The tracings recorded in Norton and those simultaneously recorded in Emporia have been uniformly identical, as illustrated in Figure 3.

The initial patients were studied in consecutive order to develop our technic, hence the diagnostic value of many of these early tracings was not of great immediate value. After the first month of operation, we limited our choice of patients to the following categories, a plan which we still follow:

1. Recent arrhythmias.
2. Chest pain suggesting heart disease.
3. Preoperative appraisal for *emergency* surgery.
4. Questions of electrolyte metabolism, particularly involving potassium levels.

We have a scheduled time of day (11:00 A.M.) to transmit though we can send and receive tracings at any time. If the consultant is out of the office when a tracing is received by the technician, he can be located and telephone the interpretation back to the sanatorium usually well within the hour.

There are some obvious limitations to this long distance type of consultation which we realized at the outset, and as we have gained experience we have learned some unanticipated lessons. Many times it would have been of great value to have previous tracings available for comparison, though our ingenious friends in the electronics field had already anticipated this. They state that electrocardiograms can be transcribed on steel tape and "played back" over the telephone whenever we desire.^{7, 9} A present disadvantage is that a patient must be moved from his home or hospital room to the telephone where the Tele-EKG has been "coupled in." In time it may be that a practical means of "plugging in" to standard telephone equipment may be feasible.

* Made by Johnnie Walker Surgical Service Company, Kansas City, Missouri, and called the Tel-E-EKG.

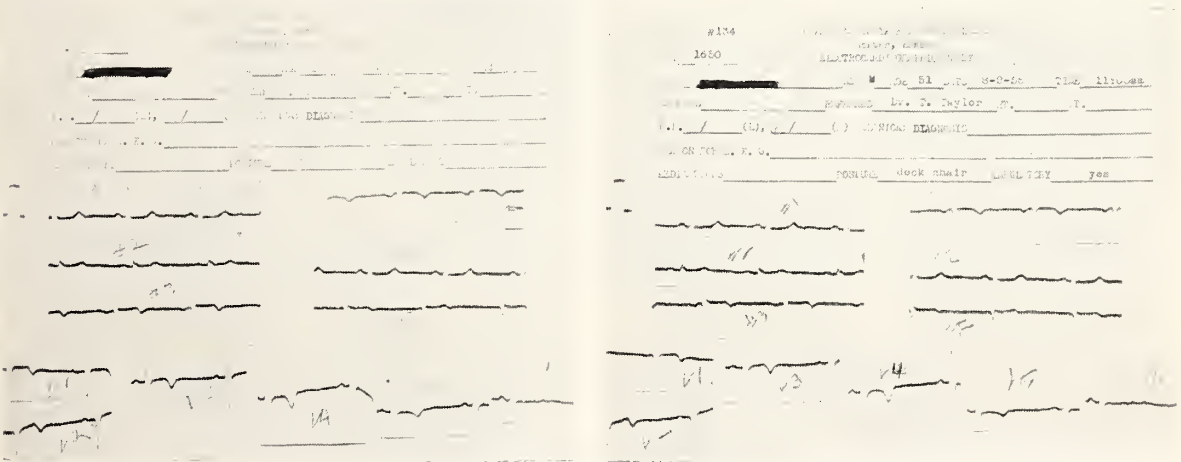


Figure 3. Comparison of the sending and receiving electrocardiogram. At left, sending; at right, receiving.

When several patients were studied in the course of one session, much valuable telephone time was initially lost in changing electrodes. We have since acquired another set of patient electrodes, and now one patient is being made ready while another is still connected to the sending apparatus. It is occasionally a problem to scan a complicated tracing quickly and report the diagnosis to the medical secretary on the sending end of the line. However, a review of our first 100 cases shows that errors picked up in a later deliberate study were of a minor nature. A cathode ray tube has been suggested as a guide in this scanning procedure⁹ though we feel we can do as well with the direct writing tracings we now have.

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Intracranial Tumors

As Encountered in a Psychiatric Clinic

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Oddly enough, it is still a common belief among medical men that intracranial tumors belong in the category of rare and hopeless diseases. However, in modern neurology such tumors are regarded as both frequent and treatable. During the last 20 years the mortality rate from early surgery of these lesions has improved dramatically, even though about 50 per cent of the tumors treated by surgery are found to be malignant, either because of their nature or their localization. This is not discouraging to the neurosurgeon, however, as he can seldom be certain of the accuracy of his pre-operative diagnosis.

The importance of early diagnosis is obvious in view of the fact that growth of the tumor often causes irreversible damage. The classical triad of symptoms, headache, vomiting, and choked discs, is of limited value in diagnosis since it points to increased intracranial pressure rather than to tumor per se. Those symptoms usually indicate a history of longstanding growth or acute circulatory disturbance, either of which is a serious condition. Absence of the symp-

toms, on the other hand, does not exclude the possibility of intracranial tumor.

One is tempted to employ the generalization that early symptoms should be searched out. Unfortunately, general rules are of little value since symptomatology varies widely with the age, nature, and localization of the tumor.

Grinker¹ believes that "the only true symptom of an intracranial tumor is the gradual, progressive loss of neurological function." It is true, however, that

SUMMARY

A survey of patients admitted to a psychiatric service in a municipal hospital showed that unsuspected intracranial tumors were found in a small number. Most of the tumors were of considerable size, and neurological signs were frequently demonstrable. The most frequent differential diagnostic problems arose in connection with other types of organic brain diseases such as arteriosclerosis, brain atrophy, and cerebral vascular accident. The possibility of intracranial tumor should always be kept in mind in psychiatric patients.

Presented before a group of Topeka psychiatrists in 1952 from clinical material first reported by the author in *Nordisk Medicin*, published in Denmark. Dr. Wagner is now en route to Copenhagen, Denmark, where he will be a member of the staff of the Department of Psychiatry, Bispebjerg Hospital.

time of admission would not indicate the specific diagnostic problems, but a survey of psychic and neurological symptoms will give an over-all impression as to their distribution. Four-fifths of the patients showed intellectual impairment, three-fifths had developed marked emotional changes, and one-half revealed impairment of consciousness varying from drowsiness to stupor. Neurological symptoms such as aphasia, epileptic seizures, and choked discs appeared with approximately the same frequency, in one-third of the patients. Hallucinations were found in only two patients where tumor involved the temporal lobe. It is especially important that more than three-fourths of the patients disclosed other neurological signs such as reflex abnormalities, paralysis of one of the extremities, or pathological changes in the spinal fluid.

Table III shows diagnoses by the referring physician, the hospital staff, and the pathologist. This gives a gross orientation as to the group of diseases in which the referring physician placed the patient. The table shows that about three-fourths of the tumors, 37 out of 49, were diagnosed clinically. Approximately half were verified at operation, the rest at autopsy. There were various reasons for the fact that not all patients with the diagnosis of intracranial tumor underwent surgery. Some were too old or in poor condition for surgery; a few died soon after admission. Autopsy examination of 20 of the 23 patients in whom tumor was diagnosed disclosed that there were 12 glioblastomas, 3 astrocytomas, and 5 metastases, mostly malignant tumors.

The tumor was diagnosed clinically on all the patients referred with the diagnosis of epilepsy, but only three-fourths came to surgery. This diagnostic efficiency may be due to the fact that the onset of epileptic seizures in adult life always causes suspicion of intracranial tumor and calls for a careful neurological examination and air study.

Patients admitted with a diagnosis of "senile dementia" constituted only a minor group numerically, but apparently diagnostic efficiency was especially low

in this instance. As expected, the most frequent error was the confusion of tumor with cerebral arteriosclerosis or cerebral vascular accident.

An example is a 64-year-old woman who complained of gradual fatigue and drowsiness five weeks prior to admission. Two weeks before admission she developed speech difficulties and a severe memory defect. The examination on admission showed clouding of consciousness, marked motoric aphasia, left central facial paralysis, and hyperactive muscle reflexes on the same side. Fundi were normal. She died within a week, and autopsy showed a huge glioblastoma infiltrating most of the right hemisphere.

The following case history illustrates that a slowly progressive deterioration may be caused by a benign tumor of considerable size. A 69-year-old woman with a six-year history of anosmia and a two-year history of short periods of excitement and confusion became stubborn, sullen, and incontinent during the two months before admission. The admitting diagnosis was senility. She was a quiet, deteriorated patient who was sent to a neurosurgical ward because of a generalized convulsion which left her with a permanent Babinski reflex. An air study showed depression of the left ventricle, and a midline meningioma the size of a tennis ball was removed from the olfactory groove.

Presenile dementia may give rise to differential difficulties with brain atrophy. The following example shows the value of a thorough examination. A 49-year-old previously healthy man was transferred from a medical ward with the diagnosis of Alzheimer's disease. Four months prior to admission he had suffered from diarrhea, followed by temporary clouding of consciousness. Examination showed a deteriorated, hypokinetic, emotionally flattened patient with a left-sided Babinski reflex. Repeated pneumoencephalograms failed to show any filling of the ventricular system, a finding usually ascribed to technical error. On the chance that it might be caused by obstruction, however, the patient was transferred to a neurosurgical ward where a 130-gram meningioma arising from the anterior part of the superior longitudinal sinus was removed.

The greatest diagnostic problem was in the group of patients with non-organic psychiatric difficulties. Fourteen of 19 were labeled as having psychotic or neurotic depression. Half of the tumors in this group were diagnosed clinically, and in the remainder the symptoms were attributed to organic brain disease, usually a cerebral vascular accident.

This example of skull trauma is cited to show that misinterpretation may lead to an incorrect neurological diagnosis. A 52-year-old previously healthy woman was admitted to the medical ward because of

TABLE III

Initial Diagnosis	Staff Diagnosis		Verified		
	Org.				
	Brain Dis.	Brain Tumor	Op.	Autopsy	Total
Psychosis	8	11	10	9	19
Senility	3	2	2	3	5
C. V. A.	1	3	2	2	4
Epilepsy	0	16	11	5	16
Others	0	5	1	4	5
	—	—	—	—	—
Total	12	37	26	23	49

a post-traumatic headache. She had had a head injury three weeks before admission, and four days after the injury she developed headache on the right side. After three weeks on the medical ward she was transferred to the psychiatric service with the above mentioned diagnosis and a suggestion that she might be malingering. Examination showed a drowsy patient with a slight left-sided paralysis of the facial nerve and bilateral papilledema. A big glioblastoma was subsequently removed from the right temporal lobe.

In some instances organic symptoms may be preceded by a prolonged period of depression, likely to be accepted as such if precipitated by a psychic trauma, as in this example. A 51-year-old sensitive and melancholy woman continued to be severely depressed for five years following the death of her husband. Two months before admission she became apathetic and drowsy and mentioned several times that she thought she was going to die. On admission she presented the picture of a lobotomized patient, friendly, somewhat silly, indifferent, and having a short attention span. She soon became disoriented and hyperactive, voided in bed, and smeared herself with feces. Positive neurological findings were slight protrusion of the right eyeball and a bilateral Babinski sign. The neurosurgical diagnosis was frontal lobe tumor, and operation revealed a big anterior parasagittal meningioma.

Information about the pre-morbid personality is of importance in evaluating character changes caused by a developing tumor. An aggravation of a neurotic condition, during the menopause for instance, may be misleading if specific points in the clinical history do not lead one aright.

A 48-year-old sensitive, exaggerating woman was admitted with the diagnosis of migraine and neurotic depression in the menopause. During the four months before admission she had suffered from paroxysmal left-sided headache, nausea, and vomiting. She had occasionally had difficulty in finding the correct words to express herself. She was described

on admission as friendly, indifferent, and without remarkable depressive features. Neurological examination was negative. During the next week she became apathetic, and during the second week she developed a slight amnesic aphasia, right-sided paralysis of the facial nerve, and hyperactive muscle reflexes on the same side. Since a tumor in the left frontotemporal region was suspected, she was transferred to a neurosurgical service, and a meningioma the size of a baseball was removed from the left sylvian fissure, extending from the sphenoidal ridge.

Deep-seated gliomas frequently give cause to an acute psychotic condition, often showing the first neurological symptoms in the terminal stage, as in the following instance. A 50-year-old previously healthy woman was admitted with the diagnosis of menopausal psychosis. Twelve days before she had been dismissed from surgical service where she had received treatment for a tibial ulcer. During her hospitalization she went through a short period of elation, but at the time of her discharge she was described as being in a normal mental condition. Immediately after leaving the hospital she became anxious, depressed, and sleepless, vomited, and complained about paresthesia in both hands. On admission to the psychiatric service she was disoriented in all three areas, was aphasic, and talked all the time. During the following week she developed paralysis of the right arm, became incontinent and comatose, and died suddenly. Autopsy revealed a cystic astrocytoma in the left parietal lobe, about the size of an orange and expanding into the lateral ventricle.

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Imagination is potentially infinite. Though actually we are limited to the types of experience for which we possess organs, those organs are somewhat plastic. Opportunity will change their scope and even their center. . . . The precision and variety of alien things fascinate the traveler. He is aware that however much he may have seen, more and greater things remain to be explored, at least ideally, and he need never cease traveling, if he has a critical mind.

—George Santayana

The Breast

A Review of Its Inflammatory Lesions and Tumors

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EMBRYOLOGY

Mammary glands first appear during the sixth week of human development as an ectodermal thickening called the milk line. Human mammary glands subsequently develop from this thickening as downgrowths of solid cords, which have been called the primary milk ducts. These later branch in the corium, hollow out, and, at their ends, dilate into secretory acini. Where the "milk ducts" open on the surface, the epidermis is elevated to form the nipple.

The mammary glands are regarded by most authorities as modified sweat glands, because of their similar mode of development and structural arrangements. Rudimentary mammary glands (areolar glands of Montgomery), which also resemble sweat glands, occur in the area about the nipple. By the time of birth little more than the main ducts are present, with their terminal acini projecting down into subcutaneous tissue. These remain as such until puberty, when the areolar region becomes elevated and a rapid enlargement takes place through fat deposition about the glands.

There will be more about this later when we discuss malignant tumors of the breast.

ANATOMY

The glandular tissue forms 15 to 20 lobes arranged radially about the nipple, each lobe having its own individual excretory duct which has an ampullary enlargement just beneath the areola. The glandular tissue does not occupy the entire eminence called the breast; a variable but considerable amount of adipose tissue fills out the stroma between and around the lobes. The connective tissue stroma in many places is concentrated into fibrous bands which course vertically through the substance of the breast, attaching the deep layer of the superficial fascia to the corium of the skin. These bands are known as the suspensory ligaments or Cooper's ligaments of the breast.

Minute processes of glandular tissue may accompany these fibrous bands into the retro-mammary tissue and thence, via septa of the pectoral fascia, between the bundles of fibers of the pectoralis major muscle. Malignant growth of the breasts may extend along these septa, a fact to be remembered in surgical removal of the breast.

The entire breast is contained within the superficial fascia. The deep surface of the gland is separated from the underlying external investing layer

of deep fascia by a fascial cleft which allows considerable mobility. Each lobe of the breast consists of numerous lobules, connected by areolar tissue, blood vessels, and ducts. The lobules consist of a cluster of rounded alveoli which open into small lactiferous ducts. These ducts unite to form larger ducts and subsequently end in a single canal for each lobule. These ducts are void of muscle tissue but contain elastic fibers. They are lined with columnar epithelium, resting on a basement membrane.

The arteries supplying the breasts are derived from three main sources. These are the intercostals, internal mammaries, and the axillary arteries with their thoracic branches. The venous drainage system begins with an anastomotic circle around the base of the

SUMMARY

A review of the embryology and anatomy of the breast and its various inflammatory lesions and tumors.

papillae of the ducts, beneath the areola. From this, large branches pass to the circumference of the gland and end in the axillary and internal mammary veins.

The nerve supply is laterally from the lateral mammary rami of the anterior rami of the lateral cutaneous branches of the fourth to the sixth intercostal nerves and medially from the medial mammary rami of the anterior cutaneous branches of the second to the fifth intercostal nerves. In addition the skin receives branches from the supraclavicular nerves of the cervical plexus. Therefore, in painful affections of the breast, the pain may be referred to the side of the chest and back, along the intercostal nerve trunks, over the scapula, along the medial side of the arm, along the intercostal brachial nerve, or up into the neck. Sympathetic fibers reach the gland, but by what course is not yet clear.

The lymphatics of the breast are numerous. There is a rich plexus in the skin of the areola and nipple which empties mainly into a subareolar plexus. Deep lymphatics arise in the spaces around the alveoli in all parts of the gland. They anastomose freely with the cutaneous lymphatics, and most of them converge toward the nipple where they join the subareolar plexuses.

From these the main lymphatics course outward along eight principal lymphatic pathways:¹ (1) axillary route, to anterior pectoral nodes (low), cen-

tral axillary nodes (mid), to subclavian nodes (high or apex); (2) internal mammary route along the internal mammary artery to mediastinal nodes; (3) paramammary route of Gerota, through the abdominal lymphatics to the subdiaphragmatic nodes; (4) Groszman's path from lymphatics beneath the breast perforating the pectoral major muscle to Rotter's nodes, thence to subclavian nodes; (5) cross mammary pathway via superficial lymphatics to the opposite breast; (6) substernal pathway to the mediastinal nodes; (7) subclavian pathway direct to the subclavian nodes, and (8) lower superficial pathway to the lymphatics of the abdominal network.

DIAGNOSIS

With this knowledge of the development and anatomy of the breast, let us proceed further with the problem at hand, diagnosing an existing pathological condition of a breast. History, inspection, transillumination, palpation, roentgenograms, and biopsy of the lesion are all used to reach this end. However, microscopic study is the only reliable basis on which to establish the final diagnosis in mammary lesions.

Clinically, if one takes into consideration the age of the patient, whether the lesion is single, multiple, or diffuse, the location of the lesion, its characteristics on palpation, the presence or absence of inflammatory signs and evidence of injury, the number of possibilities to be considered in the differential diagnoses is definitely limited.

Injury may be of significance in two mammary lesions: hematoma and traumatic fatty necrosis. Injury of the nipple during nursing may be a factor in lactation mastitis. Inflammatory signs are present in acute and chronic lactation mastitis and in some cases of tuberculosis and syphilis of the breast. Such signs are found in cases of dilated ducts beneath the nipple with an associated plasma-cell mastitis. An erysipeloid appearance of the skin is seen in cases of acute cancer, and reddening and edema with or without ulceration and infection are seen in the late stages of all forms of mammary cancer.

The age of the patient is important in determining the physiologic state of the mammary gland. The decade between 15 and 25 years is the period of adolescence and early sexual maturity. This is the time of appearance for most cases of diffuse virginal hypertrophy and benign fibroadenoma. The decade between 30 and 40 years in nonparous women is the period of menstrual cycles, and it is at this time that the various forms of mammary dysplasia or cystic mastitis are found.

In relation to childbearing, naturally, are found acute and chronic forms of lactation mastitis, galactorrhea, and galactocele, and the rapidly growing fibroadenomas and cancers of pregnancy.

At the time of the menopause large fibroadenomas

or giant myxomas may appear, also dilated ducts beneath the nipple with inspissated secretion, papillomas beneath the nipple associated with a sanguineous discharge, solitary cysts, and the various forms of mammary cancer. With advancing age, mammary carcinomas and fibrosarcomas of the breast are the predominant lesions.

Most mammary lesions are solitary rather than multiple, and few are bilateral or diffuse. Mammary hypertrophy in the male and female is diffuse and often bilateral. Among the types of mammary dysplasia or cystic mastitis, adenosis is most often a multiple and bilateral condition. Cystic disease is multiple and bilateral in some instances, and small intracystic papillomas may occur in multiple form and may be bilateral. Dilated ducts with inspissated secretion are often multiple and may be bilateral. Recurrent mammary cancer may give rise to multiple nodules (so-called carcinoma en cuirasse). Large fibroadenomas during adolescence, giant myxomas, and large mammary cancers and sarcomas may occupy the entire breast and give the impression of a diffuse lesion.

Most mammary lesions are found in the glandular tissue in any of the various portions of the breast. A few have a characteristic location beneath the nipple. Such lesions are papillomas in the larger ducts, dilated ducts beneath the nipple, Paget's cancer of the nipple, and some forms of papillary cancer and duct cancer.

The most important data from the standpoint of clinical diagnosis are those obtained by palpation. Whether the lesion is soft or circumscribed, firm or infiltrating, is important. Cysts, benign papillomas, dilated ducts, and the papillary and mucoid forms of mammary cancer may be soft or circumscribed on palpation. The same is true of mammary abscesses, galactoceles, lipomas, and the rare angiomas. The tender tissue in mastodynia, benign fibroadenomas, and nonsuppurating mastitis is firm but not infiltrating. The common forms of mammary cancer are hard, infiltrating lesions. This is also true of fat necrosis and most forms of sarcoma.

Geschickter,² in his book *Diseases of the Breast*, gives a list of 12 "don'ts" which I think is worth repeating.

1. Do not overlook early pregnancy in taking menstrual and marital history; this may be responsible for the sudden growth of a benign or malignant tumor.

2. Do not neglect a history of puerperal mastitis. Cancer occurring in the scar of lactation mastitis has a grave prognosis.

3. Do not neglect microscopic examination of any discharge from the nipple. This is necessary to distinguish between blood and inspissated secretion.

4. Do not neglect transillumination. It may reveal a nonpalpable tumor.

5. Do not palpate the breast with the patient in the upright position, but have her lie flat and palpate the gland against the chest wall with the flat of the palm or the tip of the fingers, using gentle pressure. Include the region of the axillary and supraclavicular nodes in the palpation.

6. Do not fail to determine the mobility of the tumor, if present, the mobility of the overlying skin, and that of the nipple. Evidence of traction or adherence of any of these structures may be the earliest sign of malignancy.

7. Do not omit a pelvic examination. It is important in the diagnosis and treatment of chronic cystic mastitis.

8. Do not omit a Wassermann reaction. A lesion of the nipple cannot be diagnosed without a serologic test.

9. Do not rule out the possibility of cancer without a biopsy if a definite nodule can be palpated or transilluminated.

10. Do not do a biopsy without being prepared to interpret the section and to proceed with a radical operation if indicated.

11. Do not omit roentgenograms of the chest and pelvis (including the lumbar spine) if a radical mastectomy is contemplated.

12. Do not give endocrine or radiation therapy unless the diagnosis is established.

DISEASE ENTITIES

In discussing the various disease entities of the breast, I wish to take up only a selected few of the less common ones and to go into greater detail about the group classified as chronic mastitis and tumors, both benign and malignant.

Fat Necrosis: Destruction of fat followed by regenerative process in which phagocytoses and foreign body giant cells are prominent may occur in the breast with a variety of conditions such as abscess, benign and malignant tumors, and following trauma, and may be confused clinically with carcinoma. This usually appears as a small, dense nodule and may show fixation to the skin and induration suggesting cancer. Grossly, the affected area appears encapsulated and without the infiltration seen with malignancies. On section some of these will be discovered to contain cystic cavities with cholesterol crystals and calcinosis deposits. These give the lesion its hardness to palpation. The fibrous repair easily explains the skin retraction as it acts like a strong cord which is nonelastic and tends to retract. On microscopic sections, these lesions appear as granulomatous processes in which fibrous tissue, lymphocytes, and giant cells occur together with the characteristic foam cells which are lipid phagocytes.

Plasma Cell Mastitis: This rare condition may

easily be mistaken for carcinoma, but its rapid onset, local tenderness, and puriform discharge from the nipple, together with mild temperature elevation and leukocytosis usually suffice to make the diagnosis of plasma cell mastitis. Adair³ described this as periductal mastitis arising in association with dilated ducts beneath the nipple. Because of the induration and edema of the skin, retraction of the nipple may be present. Usually the findings increase in severity over a considerable period of time, to be followed by slow resolution, leaving an indurated nodule. One of the most characteristic findings is the presence of one or more tense bands or cords, which are distended ducts, traversing the inflamed areas and from which a thick, dark discharge may be expressed on pressure. The microscopic picture is one of subacute inflammation with plasma cells predominating. Giant cells may be numerous also.

Chronic Cystic Mastitis: We now approach a subject which is the root and center of many of the difficulties in diseases of the breast. The first problem is to decide by which name the condition should be known. Its names are indeed legion. The better known fall into three groups: (1) chronic mastitis, chronic cystic mastitis, chronic interstitial mastitis, (2) diffuse fibroadenoma, cystadenoma papilliferum; (3) involution cysts, abnormal involution, cystic disease of the breast, and Schimmelbusch's disease.

It is not that the name itself is of great importance, but almost all of these names commit one to a definite theory. The first group suggests that the condition is inflammatory in nature, the second that it is neoplastic, and the third that it is a perversion of involution.

The only real evidence in support of the inflammatory hypothesis is the presence of lymphocytic infiltration, and that is always found in involution following lactation and often in senile involution.

Nor can we admit that the condition is a neoplasm. There is no tumor—that is a fact from which we cannot escape. It is true that the epithelial hyperplasia may at times suggest a neoplastic process, but the same may be said of the epithelial hyperplasia in goiter. A reasonable explanation, and one which brings the condition into line with similar conditions in the thyroid and the prostate, is arrived at by comparing the account of the physiological changes which the breast undergoes throughout life with that of the lesions in chronic mastitis.

The breast is being continually played on by a variety of stimuli which tend to induce hyperplastic changes followed later by involution. We shall find that all the changes characteristic of hyperplasia and of involution may be duplicated in chronic mastitis (lobular hyperplasia). There is evidence of epithelial activity and proliferation in the form of epithelial

buds, later atrophy of the epithelium, cyst formation, fibrosis, and round cell infiltration—in short, evidence of hyperplasia which may or may not be associated with involution.

The patient complains of pain or a lump in the breast. The pain, although usually slight, may be severe, is often worse at the menstrual period, and frequently is neuralgic in nature. The breast is tender, especially at certain points. One or both breasts may be involved, and there may be more than one lump in one breast. This multiplicity is always strong evidence against cancer.

A granular induration is felt when the breast is palpated between the fingers and thumb, much less distinctly when the flat of the hand is used. In this respect, it differs from both innocent and malignant tumors. In thin persons the breast substance has a characteristic ropy feeling. Cysts feel hard rather than fluctuating and give the induration a more coarsely granular character. The induration is frequently confined to one of the sector-like lobes of the breast, whereas in cancer no such restriction is observed. The axillary nodes are often enlarged and tender. As in carcinoma, they may not be palpable. The condition of the nodes should not be used as a means of diagnosis. The cause of the glandular enlargement in lobular hyperplasia is unknown. Although the disease is most common at the time of menopause, it may occur before the 13th year. Bloodgood⁴ states that it is more frequent in the breast which has never lactated, whether there has been pregnancy or not.

By far the most common type of cyst is what Bloodgood calls the blue-domed cyst. Its surface is smooth and the fluid contents are clear or cloudy, never hemorrhagic. Hemorrhage into a cyst indicates carcinoma.

Microscopically one sees an extremely varied picture. Considered individually, the different features are largely meaningless, but when regarded as parts of one process of epithelial hyperplasia or retrogression they become more intelligible.

The principal changes are as follows: (1) A formation of epithelial buds is similar to those seen during the involution of the breast at puberty; (2) Cyst formation is extremely common (Cheatle⁵ believes that the majority of cysts are formed not from the acini but from the ducts); (3) Papillary formation is a characteristic change in many cases; (4) The presence of large, clear, pale, epithelial cells is sometimes noted; (5) Atrophy of the epithelium rather than hyperplasia may be the dominant factor, and (6) The connective tissue usually shows a significant increase. This is best observed in the periductal fibrous tissue.

While we are discussing this common disease entity, let us ask the question, "What is the relationship

of this lobular hyperplasia to carcinoma?" The modern tendency is to regard cystic mastitis as a dangerous and precancerous condition. We must remember that this hyperplasia is the result of hormonal stimulation and that, at least in the experimental animal, carcinoma of the breast can be induced by means of estrogenic hormones.

Shields Warren⁶ gives the follow-up results after five years on 1,200 patients with chronic mastitis who had been operated upon and compares them as regards cancer incidence with a control group of corresponding age. He finds that the cancer rate for women with pre-existing breast lesions is 4.5 times as great as in controls; between the ages of 30 and 49 it is nearly 12 times as great. Warren concludes that a woman who has had chronic mastitis is in far greater danger of developing cancer, even though all the apparently abnormal tissue has been removed, but once she has passed the menopause there is no greater danger than in any control group.

Actively proliferating lesions, such as intraduct papillomas and cysts with papillary epithelium, are of graver import than large cysts with atrophic epithelium. After removal of the diseased tissue, the breasts should be examined at regular intervals. This is better than amputation of both breasts, which is not only too radical but too easy for the surgeon. Much, however, depends on the type of lesion and the age of the patient.

Schimmelbusch's Disease (Adenosis): Adenosis is characterized by the occurrence, in one or both breasts, of multiple nodules varying from a millimeter to a centimeter in size, usually distributed about the periphery of the upper or outer hemisphere. The breasts affected are small, dense, and edged like a saucer when grasped in the hand. Pain and tenderness (which vary during the menstrual cycle) occur as in mastodynia. The majority of women affected are childless and are in the late 30's or early 40's. These patients are often nervous and underweight and may have irregular menstrual cycles.

The mammary tissue affected contains dense fibrous tissue, numerous minute cysts, and foci of epithelial proliferation. The pathology of this form of mammary dysplasia was first described as a diffuse papillary cystadenoma by Schimmelbusch, who believed it to be precancerous. Bloodgood, in 1906, described it as the "diffuse nonencapsulated cystic adenomatous type" of chronic cystic mastitis.

The occurrence of small multiple nodules has been emphasized. These numerous small nodules found in the upper or outer hemisphere of the mammary gland have led to descriptive terms such as "shotty breasts," "the feeling of a bag of shot" and "palpating a bean-bag." The size of the nodules varies from 1 or 2 mm. to 1 or 1.5 cm. The larger nodules are cystic, being round, dense, and freely movable. In the ma-

jority of cases of adenosis, both breasts are affected. Bloodgood⁷ believed that if both breasts are carefully palpated, bilateral disease would always be found.

Pathologically, there is a diminution of adipose tissue and increase of fibrous tissue. The parenchyma is riddled with small cysts, minute adenomas, papillomas, and large dilated ducts. Microscopically,⁸ the salient features are (1) epithelial proliferation in the terminal mammary tubules with the formation of multiple small intraductal adenomas and papillomas—intraductal hyperplasia; (2) a disorderly proliferation of acinar elements which invade the surrounding stroma, so-called "epithelial spilling"; (3) dilatation of terminal tubules or acini with the formation of minute cysts—microcystic disease—and (4) increase in the periductal and perilobular stroma—diffuse fibrosis.

Tumors of the Breast (Benign): Of the true tumors of the breast, 95 per cent fall into two groups, fibroadenoma and carcinoma. The former constitutes about 15 per cent, the latter 80 per cent. The fibroepithelial breast tumors are essentially fibroepithelial overgrowths which are limited by a capsule. Sometimes the fibrous element is predominant, sometimes the epithelial. The development of cysts will materially modify the character of the tumor.

Three main varieties of fibroepithelial tumors may be recognized: (1) pericanalicular fibroadenoma; (2) intra-canalicular fibroadenoma, and (3) duct papilloma. Clinically, these types can't be differentiated.

In 600 cases of fibroadenoma reported by Geschickter, the age incidence was highest between 21 and 25 years. Eight per cent occurred in women past the menopause, and in about 10 per cent it occurred before the first menstruation. These tumors usually appear as a solitary lesion and most often in the upper, outer quadrant of the breast. The breasts are usually well developed, firm, and of the virginal type.

Microscopically, these tumors can be differentiated. The pericanalicular fibroadenoma appears as an overgrowth of both fibrous and epithelial structures. The acini and the ducts appear more numerous than normal and are surrounded by a stroma of fibrous tissue which varies greatly in density, and which is most evident around the ducts, accounting for the name periductal or pericanalicular. Although resembling the structure of the normal breast, that structure is never perfectly reproduced. The glandular arrangement is more diffuse, and new lobules are not formed.

The *intra-canalicular type* of fibroadenoma is more a fibroma than an adenoma. It has a remarkable proliferation of connective tissue which projects into the ducts in the form of polypoid masses, producing great elongation and distortion of the ducts. The ducts are usually much dilated. On cut section the

dilated ducts appear to be crowded with masses of fibrous tissue, each covered with a layer of epithelium invaginated from the duct wall and separated from one another by a series of branching slits.

The third type of fibroepithelial benign growths to be considered is the *duct papilloma*. Although there is a superficial resemblance between duct papilloma and intra-canalicular fibroadenoma, there is one essential difference; in the former the actively growing element is epithelium, while in the latter it is fibrous tissue. The duct papilloma also appears to have a definite relationship with duct carcinoma.

Grossly, this tumor appears as a little papillomatous growth which projects into a dilated duct, usually close to the nipple. Microscopically the picture is again a varying one. The early stage will show a typical papillary or villous formation, the delicate stroma being covered by a single layer of columnar epithelium. The larger specimens appear to have an adenomatous structure because of gland-like spaces formed by the interlacing processes. It is on this account that such misleading terms as adenocystoma and cystic adenoma have been applied to the condition. The blood vessels are large and thin-walled so that hemorrhage is common, and a discharge from the nipple, either blood-stained or serous, is one of the most characteristic symptoms.

We might also include under this classification of fibroepithelial tumors of the breast one first described by Johannes Muller⁹ as a giant mammary myxoma and called "cystosarcoma phylloides." These often grow to immense sizes and occur near the menopause. There are none of the familiar skin changes that appear with carcinoma of the breast. These large tumors have cystic spaces into which fibrous polypoid masses project. Microscopically, myxomatous connective tissue predominates, and the polypoid fibrous structures are covered by layers of cylindrical or cuboidal epithelium.

Malignant Tumors of the Breast: Let us now turn to malignant tumors of the breast. A universal classification of such is wanting, but if we look at mammary cancers as of two fundamental pathological types we can arrive at a workable classification. These are (1) the adenocarcinomas, arising from lobular structures and growing either in an infiltration or circumscribed fashion, and (2) the stratified epithelial cancers, derived from tissues concerned in the development of the nipple and larger ducts.

The adenocarcinomas or gland-cell cancers comprise 90 per cent of cancers of the breast. The gland-forming tendency of the infiltrating form (often referred to as scirrhous cancer) is not apparent under the microscope except in the more slowly growing tumors. The less common, circumscribed adenocarcinomas, comedo, papillary, and gelatinous, which grow more slowly, have more definite glandular ar-

rangements, and this group is usually referred to as adenocarcinoma.

Stratified epithelial cancers are derived from epithelium, resembling that found in the normal epidermis, and include Paget's cancer of the nipple, large cell or pagetoid duct cancer, so-called medullary cancer, and cancer cysts.

Rare forms of cancer not belonging to these two major groups include squamous cell cancer, usually complicating benign epidermoid cysts, adenocystic basal cell cancer, and cancers derived from the sweat glands.

GLAND CELL CANCERS

Infiltrating Adenocarcinomas: Approximately 75 per cent of all mammary carcinomas are of this type. These originate in the small tubules or acini which make up the lobular structure. Since the acini arise by finer ramification from the terminal tubules, there is no definite line between the two. The terms carcinoma simplex, scirrhus carcinoma, and lobular cancer are also applied to this disease process. These tend to rapidly invade the stroma.

Infiltrating carcinomas of the breast are relatively rare under the age of 26 years; however, they may occur any time after the onset of mammary development. Seventy-five per cent of all cases occur between the ages of 35 and 60 years, and 50 per cent occur between 40 and 55 years.

An examiner may have difficulty in differentiating infiltrating carcinoma of the breast from fibroadenoma, a deep-lying, thick walled cyst, residual lactation mastitis or plasma-cell mastitis, fat necroses, and indurated tissue in adenoses. Microscopically, the cells are seen to grow characteristically in small nests or narrow elongated cords with intervening fibrous tissue and, rarely, a small amount of lymphoid infiltration.

Comedo Carcinoma: Current discussions about carcinoma of the breast rarely consider the less common circumscribed forms such as comedo, papillary, and mucoid or gelatinous adenocarcinoma which differ greatly in their manner of growth and prognosis from the infiltrating form just described. Comedo carcinomas were first described by Bloodgood as slowly growing cancers which arise from the terminal ducts. These have a tendency to invade pre-existing ducts and to be confined by the walls of the ducts.

Because comedo carcinoma arises within the terminal tubules which have lost most of the lobule-forming capacity that is seen in infiltrating carcinoma of the breast, and since vascularity in this area is less, these growths metastasize relatively late and have in general a favorable prognosis. It is significant, therefore, that no case of adenocarcinoma of the comedo type has been described in connection with pregnancy. It is seen in women past the menopause, or

in younger women with a history of surgical castration, sterility, or of chronic cystic mastitis.

The cut surface looks like the cross section of a freshly sawed plank of wood. On pressure, plugs of tumor cells may be expressed from the ducts like comedos from a blackhead. Under the microscope, rings of carcinoma cells line the pre-existing and newly formed ducts, and small acinar spaces form within the thickened rings of cancer cells. Rarely, this may assume the role of an infiltrating carcinoma, as seen when the carcinoma cells infiltrate beyond the basement membrane of the ducts and invade the fat and fibrous tissue. This, of course, adds materially to the gravity of the prognosis.

Papillary Adenocarcinoma: The largest group of circumscribed mammary carcinomas shows a papillary or adenocystic structure. They may occur at any time after onset of menstruation. They are usually of large, bulky size, situated centrally beneath the nipple, and about 14 per cent are associated with discharge from the nipple. They may arise from pre-existing benign intra-cystic papillomas. These tumors, like the infiltrating adenocarcinomas, also arise from epithelium destined to form mammary lobules. They tend to grow in coils and papillary folds and form acinar structures. The epithelium from which they arise, however, is not usually of the functioning variety. Instead, it represents remnants of the primary mammary sprouts from which the lobular tissue eventually forms, but which have been left behind in the region of the larger ducts in the nipple zone. These tumors are usually found free in the dilated ducts, attached only by a stalk. It is at this point that invasion into the stroma occurs. Pathologically, these tumors have a papillary and cystic structure and may contain necrotic tissue or hemorrhagic fluid.

Because of the vascularity of these growths and pedicle-like arrangement of their nutrient vessels, these are among the most radiosensitive of the mammary cancers.

GELATINOUS OR MUCOID ADENOCARCINOMA

Mucoid degeneration occurs in some slowly growing papillary adenocarcinomas. Whether this mucoid or gelatinous substance is secreted by the epithelium or is a degenerative change in the connective tissue, or whether both may occur, has been the subject of controversy. An epithelial origin of the gel is most probable, according to Broders.

These gelatinous growths have individual peculiarities. They usually grow slowly and metastasize late; some of the largest mammary cancers described have been of this character. Mucoid change may affect any of the glandular forms; it is most often seen, however, as a degenerative change in papillary adenocarcinoma. Mucoid cancers are soft and may have a cystic or fluctuant feeling on palpation.

When cut across, a semi-fluid, tapioca-like material oozes or flows from the incision. Under the microscope the nests of epithelium are widely separated by the pale-staining gelatinous substance. Recurrence due to transplantation of this material into the wound may take place years after operation.

STRATIFIED EPITHELIAL CANCERS

In the development of the breast, the nipple bud, forming from a downgrowth of epidermis, precedes the formation of the mammary sprouts from which the lactiferous ducts, the terminal tubules, and the lobular structures are derived. The invaginating epithelium of the nipple bud undergoes hyperdifferentiation and the central squamous cells are desquamated, forming the hollow of the nipple pouch. Prolongations of the stratified epithelium from this pouch line the openings of the larger mammary ducts. Cancers forming from this epithelium have characteristically large cells with granular, eosin-staining cytoplasm and have been grouped together under the heading of stratified epithelial cancers.

Paget's Disease: This comprises 5 per cent of mammary cancers and is characterized by lesions of the nipple and by presence of large Paget's cells in the epidermal coverings of the nipple and with few exceptions in the mouths of the adjoining ducts. Broders¹¹ feels that this is a picture of carcinoma *in situ*. He also states that in 99 per cent there is an associated deep lying adenocarcinoma and that in the other 1 per cent it is there too but has not been found. Some authors maintain that the large granular Paget's cells are of sweat gland origin. This resemblance to cells of the apocrine sweat glands is understood when it is recalled, from an evolutionary standpoint, that the breast is a modified sweat gland and that these epidermoid-like cancers arise from relatively primitive mammary structures derived from the nipple pouch.

Intra-Duct Carcinoma: This group is less frequently reported than the Paget's type and is one in which the cancer affects chiefly the mammary ducts. Histologically the tumor tissue is identical with that formed in Paget's cancer of the nipple, but, as a rule, younger patients are affected and the clinical course is more rapid and malignant.

Medullary Cancers: This is another group of carcinomas which arise from transitional epithelium rather than from mammary glandular epithelium. In these, the tumor arises deep in the substances of the breast, and neither the nipple nor the large ducts adjacent to it are primarily affected. These may grow to a large size and undergo cystic degeneration, or they may remain relatively circumscribed and have a granular structure, resembling sweat gland cancers. Whether they arise from derivatives of the primitive

nipple pouch or owe their microscopic peculiarities to a process of metaplasia is difficult to determine.

NEOMAMMARY CANCERS

For the sake of completeness let me merely mention a group of neomammary cancers, to include intramammary stratified epithelial cancers, sweat gland cancers and circumscribed epidermoid cancers. Stratified epithelial cancers may occur deep in the breast and resemble histologically either nonkeratinizing epidermoid carcinoma of the skin or cancer arising in sweat glands. While in most instances either epidermoid or glandular features predominate, in some instances a combination of both is found. When it is realized that the breast is a modified sweat gland derived from the epidermis, it is easy to comprehend why these tumors originating in archaic epithelium resemble the epidermis in their undifferentiated portions and the sweat glands in the more highly differentiated parts. Despite their highly malignant appearance under the microscope, these cancers in which glandular features are prominent have a relatively good prognosis even when of large size and when they occur in women younger than 40 years.

MAMMARY SARCOMAS

Because of the rarity of these tumors, I want to mention them without further discussion. If the epithelial and mesenchymal elements of the breast were equally susceptible to malignancy, sarcoma rather than carcinoma would be the most frequent, since the latter exceeds the former in amount except during the periods of late pregnancy and lactation.

While the total number of sarcomas of the breast is small, the pathologic variety is great. Those originating in the fibrous stroma of the gland are varieties of fibrospindle-cell sarcoma which grow to immense size and metastasize relatively late. They are of two forms: (1) mammary fibrosarcoma which is primary in the connective tissue, and (2) mammary adenosarcoma which is secondary to fibroadenoma and contains scattered epithelial elements. Approximately one-half of all the sarcomas in the mammary gland are of these two varieties. Of the non-indigenous sarcomas of the breast, there are the osteogenic sarcomas, lipo- and myosarcomas, lympho-, myelo-, and angiosarcomas, and sarcomas of nerve sheaths and melanomasarcomas.

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

The second session of the 84th Congress is under way, and in medical legislation—as in all other fields—this promises to be much livelier than last year's deliberations.

For one thing, neither the Republican administration nor the Democratic party, which is in control on Capitol Hill, got anywhere near as much as it wanted last year in medical legislation.

For another thing, and something that shouldn't be lost sight of at any time, both parties this year will be legislating with one eye cocked toward next November, when the voters make a choice between the two parties. Try as they might to pass laws for the good of all the people, neither party can afford to ignore the political realities of the situation: each will want to take credit for any legislation with popular appeal or, where that is impossible, at least to see that the other party doesn't get the credit.

In front of this political mosaic, these are some of the medically-important issues that will be fought out in Senate and House:

1. Federal guarantee of mortgages on health facilities. This has been on the Congressional calendar for two years; it was pushed hard in 1954, and was given some consideration in 1955. It would mean that the federal government would underwrite mortgages for hospitals, clinics, and nursing homes, under certain conditions, thereby allowing some sponsors to obtain loans they couldn't otherwise get, or to obtain them on longer terms and with lower interest.

2. Federal grants for research facilities. Under this plan—approved last session by the Senate—the U. S. would make outright grants to laboratories, medical schools, and clinics for building facilities for research in specific diseases, such as cancer and heart disease.

3. Federal aid to medical education. This peren-

nial project probably is closer to Congressional enactment now than ever before. The most popular bill is one restricting the federal role to grants for building and equipment, with a financial incentive held out to those schools willing to increase their enrollment. This bill may be tied in with some other grants bill, such as the one for research.

4. Salk vaccine. Legislation authorizing federal appropriations for the purchase of Salk poliomyelitis vaccine (\$30 million for the current year) expires February 15, virtually insuring Congressional action of some sort before that date. One issue is whether the federal government should continue the grants; more controversial is the question of whether the U. S. should move in to control the allocation and distribution of the vaccine. Allocation and distribution now are handled under a voluntary program supervised by the U. S. Public Health Service.

5. Increases in federal appropriations for medical research. Over the last few years—since the National Institutes of health came of age—Congress repeatedly has increased research grants over the amounts the Budget Bureau allowed Public Health Service to request. Indications are that this year the Budget Bureau may have to give way and allow important increases to be requested of Congress. Congress probably would want to add on its own special additions anyway, resulting in more money than ever before available for work on cancer, heart disease, mental illness, arthritis, blindness, and the many other conditions.

6. OASI-covered persons could receive payments beginning at age 50 if determined to be disabled. Under present law retirement payments for all are available at age 65. The bill containing this provision (H. R. 7225) passed the House last session by an overwhelming margin. It is now before the Senate Finance Committee, where the next phase of the legislative contest will be fought out in 1956.

The lop-sided House vote on disability payments may be discounted in part because of the parliamentary maneuvering by sponsors of the legislation. House members had only 40 minutes to debate this bill, and no opportunity to amend it. It was a case of accepting the whole bill—which contains a number of other social security liberalizations not of medical significance—or being politically damned as opposed to social security per se.

The American Medical Association maintains that the present expanding rehabilitation programs would be undermined by cash payments for disability, that the financial and other long-range aspects of the disability payments plan have not been thoroughly studied, and that the machinery for disability payments would inevitably project the federal government deeply into the medical care picture.

PRESIDENT'S PAGE

DEAR DOCTOR:

Happy New Year!

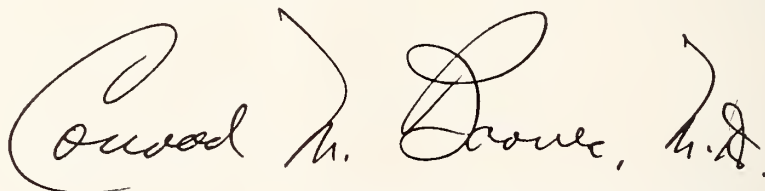
Thank you for the extension of Christmas greetings through your A.M.E.F. contributions. And, speaking of contributions, the John Porter Memorial Fund now stands at \$4,245.

The A.M.A. meeting in Boston was both interesting and instructive to me. The lectures, scientific exhibits, and deliberations of the House of Delegates were all smoothly executed. The House of Delegates took unprecedented action toward better hospital, medical school, and specialty relations which is for the primary benefit of patients and family physicians. This interim meeting went on record as favoring an all out campaign to halt hospital discrimination against general practitioners. Further, the A.M.A. will stimulate the formation of general practice departments in all medical schools and will insist that medical students be given experience in general practice. The Joint Commission on Accreditation of Hospitals will ask that full accreditation be withheld from community and general hospitals that exclude or restrict generalists on an arbitrary basis.

The panel discussion on "Psychotherapy in General Practice" was extremely interesting and informative. The highlight of this discussion was a letter from the moderator's (Dr. Forkner) pastor concerning his attitude on psychiatry. Here are a few quotes from the letter. "For a long time I have felt that people get off the beam in their thinking because they have followed the wrong guideposts leading them away from genuinely happy lives. If this is so, then we must erect for them different guideposts leading toward happy lives. . . . The Great Physician provided not only the formula for healing mental ills, but he also gave us precise tools to implement the formula. . . . The most powerful tool is prayer. . . . My plea is for a closer integration of psychiatry with spiritual values. . . . I would like to see a school of psychiatry founded on the theory that people think abnormally because they have never learned the formula for happiness and have not been taught how to apply this formula to their daily lives. . . . Herein may lie an enormous field of preventive medicine in which science and religion may share in a rich reward." Would you like to read this letter in its entirety?

In light of the above philosophical consideration, permit me to express myself concerning the wonderful experience our family and community recently enjoyed while we entertained our preceptee. Manohar Deosaransingh, Kansas medical school senior of Patna, Behar, India, really aroused us to the fact that America is now living with emphasis on artificial or material values. This should cause us to think seriously about our future as a nation, for in the beginning we were certainly founded on spiritual values. Where are we going, America?

Sincerely, in the Practice of the Art,

A large, stylized handwritten signature in dark ink, reading "Conrad M. Barnes, M.D." The signature is fluid and cursive, with the first name "Conrad" being particularly prominent.

CONRAD M. BARNES, M.D., *President*

EDITORIAL COMMENT

Referrals to K.U.M.C.

The Committee on Medical Schools, of which Dr. R. W. Fernie of Hutchinson is chairman, believing that the mechanics of referring patients to the University of Kansas Medical Center are not completely understood, has obtained information from Dr. W. Clarke Wescoe.

Physicians are invited to use the faculty of the University of Kansas Medical Center for consultation services or for specialist care of patients should they care to do so. It should be quite clearly understood that this is a private arrangement between two physicians, just as any referral might be made elsewhere.

Patients cannot be accepted if referred to the medical center or if referred to a department. Referrals must be made to a specified physician. That, of course, can be done by mail or over the telephone, and a little history concerning the patient is as helpful to the professor at the school of medicine as it is under similar circumstances to the specialist in private practice. In return, the referring physician will receive a report concerning the patient, and, because of improved circumstances at the school, these reports will now arrive more promptly than in the past.

Listed below are the full time members of the faculty, divided into departments. It is recommended that this list be retained for future reference. Your committee wishes to remind again that a referral must be made to an individual physician and cannot be accepted otherwise. If there is any doubt concerning this procedure, the dean's office may be contacted and the communication will then be forwarded to the faculty member qualified to handle the problem.

The address of the University of Kansas Medical Center is 39th and Rainbow Boulevard, Kansas City, Kansas, and the telephone number is TAlbot 2-5252.

The Committee on Medical Schools hopes this information will be of service by increasing the efficiency of the normal professional contacts between the faculty and the Kansas physician in private practice.

DERMATOLOGY

Dr. Richard L. Sutton

MEDICINE

General

Dr. Mahlon Delp
Dr. Max Allen
Dr. Edward H. Hashinger
Dr. Robert Jordan
Dr. John Christianson
Dr. Robert Weber
Dr. Jesse Rising

Cardiovascular

Dr. E. Grey Dimond

Neurology

Dr. A. T. Steegmann

Metabolic

Dr. Robert E. Bolinger

Gastroenterology

Dr. Arthur Klotz

Hematology

Dr. Sloan Wilson

Chest

Dr. Martin FitzPatrick

OBSTETRICS AND GYNECOLOGY

Dr. L. A. Calkins

Dr. Robert Newman

Dr. Rosemary Schrepfer

Dr. Charles A. Hunter, Jr.

Dr. Eugene W. J. Pearce

OPHTHALMOLOGY

Dr. A. N. Lemoine, Jr.

OTORHINOLARYNGOLOGY

Dr. G. O. Proud

PATHOLOGY AND ONCOLOGY

Dr. Robert E. Stowell

PEDIATRICS

Dr. Herbert Miller

Dr. Herbert Wenner

Dr. Antoni Diehl

Dr. Franklin C. Behrle

Dr. C. Arden Miller

Dr. Daniel Darrow

Dr. Alice Marsh

Dr. Jacqueline Baumeister

PHYSICAL MEDICINE

Dr. Donald L. Rose

Dr. Edward B. Shires

PSYCHIATRY

Dr. William F. Roth, Jr.

Dr. M. T. Eaton, Jr.

Dr. Paul C. Laybourne, Jr. (Pediatrics)

Dr. Jane Tillinghast

Dr. Carol W. Powell

RADIOLOGY

Dr. Galen M. Tice

Dr. Donald R. Germann

Dr. Karl Youngstrom

SURGERY

General

Dr. Frank F. Allbritten, Jr.
Dr. Stanley Friesen
Dr. Creighton A. Hardin
Dr. C. F. Kittle
Dr. Paul Schloer

Neurosurgery

Dr. William P. Williamson
Dr. Charles Brackett

Orthopedic Surgery

Dr. James B. Weaver

Plastic Surgery

Dr. David Robinson

Urology

Dr. William Valk

Medical Education Contributions

Announcement of the recent commitments of the Commonwealth Fund and the Ford Foundation in support of medical education has been generally received with acclamation and sincere public appreciation. Ten university medical schools have received grants totalling \$7,150,000 for medical education from the Commonwealth Fund. The Ford Foundation will grant \$90,000,000 to privately supported medical schools as endowment to help them strengthen their instruction, although the exact allocation to the individual schools has not yet been determined.

These two great philanthropic organizations have recognized that unless the increasing financial needs of medical education are met, the current high standards of medical training in the United States are in jeopardy. These grants will aid in meeting some of the needs that have existed during recent years, but they have not closed the gap that has been represented as being equivalent to approximately \$10,000,000 annually. In other words, there is still great need for active and increasing support of medical education through the American Medical Education Foundation and the National Fund for Medical Education if the estimated current needs are to be adequately covered.

In explanation it's wise to stress that the Ford Foundation and the Commonwealth Fund have given these grants as *endowments*. At 4 per cent interest, this will return to the schools about \$4,000,000 a year. This is a handsome sum, but it is still necessary to continue the good work that has been done to support our medical schools.

Longevity in Kansas

The Bureau of Medical Economic Research recently published a bulletin showing that Kansans are exceeding the national longevity rate. It was believed that this is of sufficient interest to be reprinted from the *Journal of the American Medical Association*, December 3, 1955.

"Often the opinion is heard that the healthiest people in the United States live in heavily populated

areas where hospitals, physicians, and other health facilities and personnel are plentiful. Recently published data on the expectation of life, particularly at birth, in each of the 48 states for 1949-1951 refute this popular notion, especially for white males.¹ The statistical department of the Metropolitan Life Insurance Company has assisted the National Office of Vital Statistics of the Department of Health, Education, and Welfare in the preparation of life tables for each state. All the tables, including those for non-white males and females, will be published soon by the National Office of Vital Statistics.

"The six states with the highest expectation of life at birth for white males for 1949-1951 were: South Dakota, 68.4 years; Nebraska, Minnesota, and Iowa, 68.2 years; Kansas, 68.0 years; and North Dakota, 67.9 years. The expectation of life at birth for white males in the United States was 66.3 years. In 1939-1941 the six leading states for white males were Nebraska, South Dakota, Minnesota, Iowa, North Dakota, and Kansas. Thus it is obvious that white males of these sparsely settled states still enjoy comparatively low mortality. The only changes apparent in the figures cited above are (1) South Dakota has replaced Nebraska as the leader, and (2) Kansas and North Dakota have exchanged ranks.

"It is not possible to say that longevity will actually be greatest among the white males of these six states, because expectation of life is an actuarial computation based upon the mortality rates at all ages in three specified calendar years. The computation, strictly speaking, is not a forecast of the mortality that will prevail during the entire lifetimes of the babies born in each of these six states in the specified three calendar years. These favorable mortality records among white males in these six states must be attributed, in part, to the strong North European strains in the population and favorable selection factors in migration. The number of miles that many people in these states must travel to visit a physician or become a patient in a hospital might be considered a health hazard by many urban dwellers, but the people in the West North Central region of the United States have developed a way of life that makes them well adjusted to these spatial conditions.

"Nebraska retained its leadership in life expectation at birth for white females with 74.0 years as compared with 72.0 years for the entire United States. Oklahoma, Florida, Iowa, Kansas, and South Dakota follow with 73.8 to 73.6 years. A more general observation is that the state variations in longevity as indicated by expectation of life at birth were less in 1949-1951 than they were in 1939-1941. The leaders in expectation of life at age 25 were South Dakota,

¹ State Variations in Longevity, Metropolitan Life Insurance Company Statistical Bulletin, Oct., 1955.

Nebraska, and Iowa, with 46.8 years for white males. The leading states for white females at age 25 were Oklahoma, Nebraska, Florida, Arkansas, Kansas, Iowa, Texas, South Dakota, and Utah, ranging from 51.8 years to 51.1 years. The states in which the people at age 65 had the greatest expectation of life were Arkansas, Florida, and Oklahoma for white males and Florida, Arizona, Arkansas, Oklahoma, and Texas for white females.

"The variations in expectation of life in 1949-1951 at these three selected ages were less marked, of course, among the nine regions than among the 48 states. The West North Central region (Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, and Kansas) had the highest expectation of life for white males at birth (67.8 years) and at age 25 (46.4 years), but the West South Central region ranked first at age 65 (13.4 years versus 13.3 years). For white females the West North Central region had the highest expectation of life at birth, 73.3 years; at age 25 its 50.9 years ranked it second to the West South Central region with 51.2 years; at age 65, however, it was outranked by a small margin by the West South Central, Mountain, and Pacific regions. In 1939-1941, the West North Central region ranked first in expectation of life at birth, at age 25, and at age 65 for white males; and first at birth, first at age 25, and tied for second at age 65 for white females. These data for the nine regions, as well as those for the individual states, should remove all doubt about where the expectation of life is and has been the highest, particularly at birth and at age 25."

Workmen's Compensation

A new book has recently been published by the Workmen's Compensation Commission of Kansas. It includes the Workmen's Compensation Law as well as procedure, rules, and theory of compensation.

The Committee on Industrial Medicine of the Kansas Medical Society, of which Dr. W. L. Anderson of Atchison is chairman, played a part in the publication by studying the medical fee schedule and recommending many changes from the old schedule. The commission accepted the recommendations, and the fees published are those outlined by the committee.

In discussing the entire structure of workmen's compensation, and particularly the physician's report, the following suggestions are made to expedite administration of the program and to continue the good relationship between the medical society and the Workmen's Compensation Commission. Most physicians are familiar with the physician's report blank. Sample copies may be obtained by writing to Work-

men's Compensation Commission, 501 Jackson Street, Topeka. The suggestions follow:

1. When the word "member" is used, it refers to the general body disability as well as fractures, amputations, etc.

2. A separate x-ray diagnosis attached to the report blank is accepted and recommended.

3. Space is provided to state whether the patient needs further medical care and for how long. If the patient needs additional care beyond stated date, the physician should report this in writing to the employer or insurance carrier.

4. With reference to eye injury, the physician may write a letter and attach it to the form, stating percentage of loss of vision due to the accident.

5. The physician should not mention illnesses which do not pertain directly to the injury unless the disability has been aggravated by the injury.

6. According to the law, the physician must submit the report to the employer or insurance carrier within 15 days after examination.

Questions in regard to workmen's compensation may be directed to the Workmen's Compensation Commission or to the Committee on Industrial Medicine of the Kansas Medical Society.

STATISTICS ON CONGRESSIONAL BILLS

A study of bills introduced in the last two sessions of Congress, the 83rd and the 84th, made by the A.M.A. Committee on Legislation, shows that an increasing number of subjects considered have medical implication.

During the two sessions of the 83rd Congress, 16,470 bills were introduced, and 407 of those pertained to medicine. During the first half of the 84th Congress, 11,914 measures, 403 pertaining to medicine, were introduced.

The A.M.A. committee has met four times so far this year and has considered 284 bills embodying 92 major legislative proposals. The group has also considered 10 major policy questions on which legislation has not yet been introduced. Fifteen witnesses have testified before committees of the Congress on 21 separate bills, and the secretary and general manager of the A.M.A., Dr. George F. Lull, has submitted the written views of the association on nine other proposals.

All of the 403 measures introduced this year were reported in the A.M.A. *Washington Letter*. Congress held hearings on 49 of those, and the committees reported favorably on 11. Five were passed by both houses and have been signed by the President. Four of the five that became law were supported by the A.M.A.

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"... The causes [of morning sickness] are increased activity of the nerve force, whereby the equilibrium between digestion and assimilation is greatly disturbed. With those women who have habitually weak digestion this is not much of a symptom. Indeed, they will have better digestion and keener appetites for the reason that the action of the nerve force has been increased, whereas it had previously been deficient. When this annoying sickness is persistent and obstinate, yielding to no remedies, diet or regimen, we may suspect displacement of the womb, possibly ulceration at its neck. . . .

"Among women who live in towns and lead a sedentary life constipation is a frequent attendant of pregnancy. There are other things besides indolent habits that may give rise to constipation, among which are the pressure of the enlarged womb upon the bowels, and a kind of torpor produced by the diverting of the nerve force and muscular supply to the womb.

"When there is a general swelling which is more immediately noticeable in the hands and face, it may . . . be caused by a disorder known as albuminuria. This is a condition in which the albumen of the blood, instead of going to supply the body, finds its way out through the kidneys. Such swellings should lead at once to an examination of the urine to determine whether or not albumen is present. . . . Indeed, it is a wise precaution to use this test at different times during pregnancy, whether the disorder under discussion is suspected or not. The violent and fatal convulsions in childbed are occasioned by albuminuria, which is induced by a condition of the kidneys that obstructs the circulation of the blood, causing a retention of urea in the blood, and thus producing what is known as uraemic poisoning. This condition exists, to a greater or less extent, oftener than is suspected by most people, including physicians; hence the urgency of frequent tests to decide about its existence. It can be corrected by a skillful physician. . . .

"Abortion must be regarded as a serious evil. It not only deprives the mother of the

product of her pregnancy, but often places her health and even her life in peril. . . . Fleishy women subject to profuse menstruation, very impressible, nervous women easily excited by passion or mental disturbances, and those who indulge immoderately in the pleasures of society, dancing, late hours and tight lacing, are liable to the misfortune. Such as are occupied at the sewing machine are constantly exposed to this mishap. . . . A sudden leap from a carriage, reaching up and straining, excessive fatigue, too frequent coition, violent fits of anger and other passions, are causes.

"Under such conditions [flooding] the woman's head should be lowered and the hips be a little elevated. An injection of ice-cold water will often be effectual; at the same time some pieces of ice may be swallowed. A treatment quite the reverse of this is popular and efficacious at the present time, and consists in using hot-water injections, temperature 95° to 100°, and applying rubber bags filled with hot water to the spine. Place the child to the breast. The object of these various means is to promote contraction of the womb. Nothing is simpler or perhaps better than dipping the hand in cold water, placing it on the abdomen, and grasping the womb to stimulate it to contract. . . ."

Thus did they explain and treat some of the complications of pregnancy 70 years ago, as detailed in a *Compendium of Health* of the period. Explanations of symptoms and the treatments prescribed sound peculiar to us today, yet there are within the same paragraphs statements which are as acceptable today as they were then—for example, that "morning sickness may begin almost immediately after conception" but "generally does not begin until after the lapse of two or three weeks, but then continues more or less constantly and severely for three or four weeks . . ." and that "miscarriages happen oftener at the third month of pregnancy." How do you suppose our present books will sound in 2025?—O.R.C.

Tumor Conference

Basal-Cell Carcinoma of the Lower Lip

Edited by **HOWARD P. FINK, M.D.**

Dr. Friesen: The following case is presented because it concerns a common lesion occurring in an uncommon location. Will you give us the history, Dr. Gwinn?

Dr. Gwinn: This patient is a 75-year-old retired farmer who, one year ago, developed a sore on the right side of his lower lip which failed to heal. He tried various home remedies, none of which seemed to do any good. The sore didn't cause him any trouble and did not enlarge. However, in August, two months ago, he had a very painful swelling in the right submandibular area, just below the lesion on his lip, for which his local doctor referred him here.

The workup here revealed the sore on his lower lip, which you see as a punched out, indurated ulcer about .5 cm. in diameter (Figure 1). The right sub-

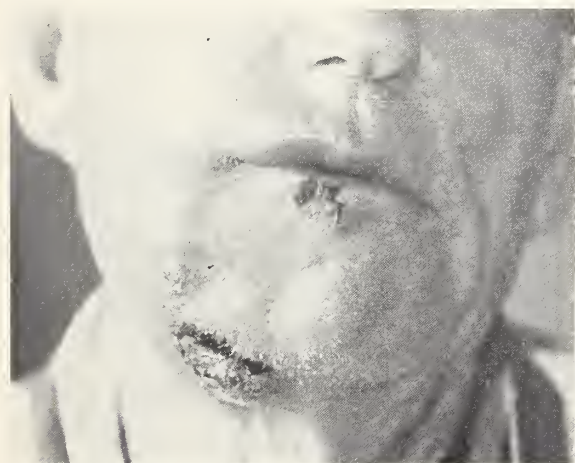


Figure 1: Ulcerated lesions of the lip and submandibular area.

mandibular area is quite swollen and painful. A biopsy of the lesion of the lip was reported as a basal cell carcinoma. X-ray examination showed rarefaction of the mandible and abscesses of the teeth in the swollen area but no evidence of any metastatic disease. The teeth were subsequently removed, and the submandibular abscess and cellulitis were improved after penicillin and drainage.

It is interesting to note that the patient's father died of a carcinoma of the lip.

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and from the Kansas Division of the American Cancer Society. Dr. Fink is a Trainee of the National Cancer Institute.

Dr. Friesen: This looks like a serous lesion. May we see a microscopic section of the biopsy?

Dr. Mantz: Two pieces of tissue were taken. Both of them show a typical basal cell carcinoma consisting of large club-like clusters of cells (Figure 2) which penetrate the underlying connective tissue to a considerable depth. The epidermis is slightly acanthotic except over the lesion where it becomes thin and ulcerated. Numerous small cyst-like areas are scattered throughout this neoplasm, but otherwise it appears to be a fairly orderly basal cell lesion with distinct palisading of cells at the periphery. The clear areas sometimes contain foamy-appearing cells, probably macrophages. They suggest, however, the remote possibility that this lesion may be of cutaneous adnexal origin, possibly derived from the sebaceous glands.

This lesion shows, as most basal cell carcinomas do, the defense mechanism of the host against the advancing edges of the carcinoma, in the form of an inflammatory reaction, which, in this lesion, includes giant cells of the foreign body type.

Material from the mandibular area shows chronic inflammation consistent with the lining of an abscess.

Dr. Friesen: May we see the x-rays?

Dr. Goertz: X-rays of the mandible show abscesses at the roots of the teeth and decalcification

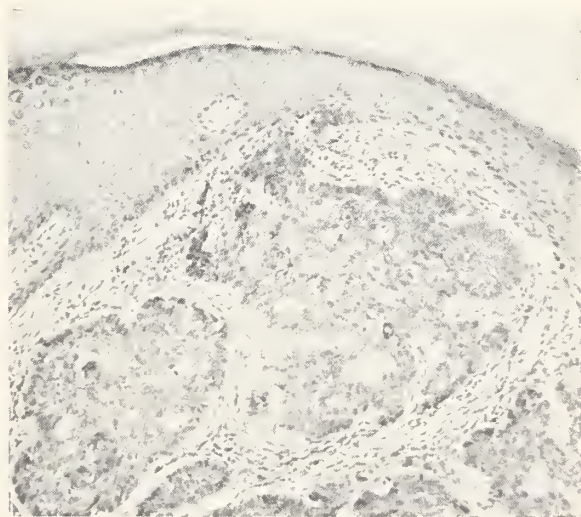


Figure 2: Basal cell carcinoma, showing downgrowths of neoplastic epithelium containing cystic spaces, x 100.

which seems to be a little more marked on the right than on the left.

Dr. Friesen: Dr. Robinson, when I went to medical school, we were taught that basal cell carcinomas occur above the mouth-to-ear line, and squamous cell carcinomas below. This case is apparently an exception to that rule.

Dr. Robinson: That's right. If one looks at this lesion and at the mass in the patient's neck, which seems to be fixed to the mandible, one might say that this is a bad situation. Here, apparently, is a carcinoma which has metastasized and is now suppurating and necrotic, and surgery would have to be radical to save this man's life. There should be something in the history, though, that would lead us to think that our first impression is mistaken. Dr. Gwinn, how rapidly did this mass develop in his neck?

Dr. Gwinn: Very rapidly. It appeared in the course of a few days.

Dr. Robinson: Was it tender?

Dr. Gwinn: Yes.

Dr. Robinson: Did it drain spontaneously?

Dr. Gwinn: Yes. It was draining when he came in.

Dr. Robinson: This story indicates an abscess rather than a metastasis. Still, one can't be certain without more data. The biopsy here was of primary importance. To find a basal cell carcinoma by biopsy in an ulcer of the lower lip is surprising because, as Dr. Friesen indicated, nearly all such lesions are squamous cell carcinomas, which tend to metastasize, whereas basal cell lesions rarely do. More basal cell than squamous cell lesions occur in the upper lip, and carcinomas of the lower lip are nearly all squamous. Occasionally, we do see each of these lesions in the opposite location.

When Dr. Edwards removed several carious teeth from this man's lower jaw, he found extensive periodontal infection. So, I think we can say that the jaw lesion is not a metastasis but simply a local infection from bad teeth, and our initial impression that this was a metastasizing squamous cell carcinoma was wrong.

The question of treatment resolves itself now to simple excision of the lesion. We will do this in a few days, when the inflammatory edema has subsided somewhat.

Dr. Friesen: Is he getting antibiotics?

Dr. Gwinn: Yes, he is.

Dr. Friesen: Is the swelling subsiding?

Dr. Gwinn: Yes.

Dr. Friesen: Are basal cell carcinomas usually treated by surgery or by irradiation, Dr. Robinson?

Dr. Robinson: We prefer to treat them by surgery because we think that we have better control of their removal than do the radiologists. At the time of re-

moval, if we are at all in doubt, we can have frozen sections made to be sure that we are dealing with a tumor. Also, we believe that by not obscuring the issue with late irradiation changes and by eliminating radiation fibrosis, we can diagnose recurrences a little quicker. It is true that we usually must cut 5 to 10 mm. beyond the visible edge of the lesion to be sure of its complete removal. Paraffin sections must be carefully studied to be sure that we have cut beyond any crab-like extensions of the tumor, but, in general, where one can do so without distorting tissues to a great extent, and where the lost surface can be easily replaced, I think it is better to excise such lesions and be done with them.

However, there are some parts of the face where we prefer irradiation because we think the radiologists do a better job than we do with less distortion and mutilation. This is a moot question, and some people would elect to excise all basal cell lesions, but I am sure the little ones around the eyelids and inner canthus where they can be well shielded, and those around parts of the nose not directly over cartilage, can be well handled by irradiation.

Dr. Friesen: If you had a patient with a large ulcerated lesion on the cheek which would necessitate a skin graft if you excised it, would you prefer excision to irradiation?

Dr. Robinson: Yes, I would, because I think that I would have better control of the tumor. However, when a large surface defect is left after excision, one must figure how he is going to cover the wound, since wounds of the face are rarely left open for long. A skin graft may be required. The choice between irradiation and surgery often depends on the ability and preference of the man who is treating a particular lesion. I am sure that some of the lesions that I would excise, Dr. Tice and his associates could treat with equally good results.

Dr. Tice: I am sure that both radiologists and surgeons are influenced by their personal experience in treating epitheliomas of the skin. As a radiologist, I am not particularly concerned whether a given lesion is a basal cell or squamous cell carcinoma, but I am concerned about the location of the lesion and, in some instances, about the size of it. The common site of a basal cell lesion is the face, and here small cancers can be treated easily, effectively, and with good cosmetic results by irradiation. If the lesion involves an entire cheek or the entire forehead, the radiologist should consider calling for surgical consultation, although even such large lesions may be treated in sections using deep x-ray therapy instead of superficial therapy. A lesion over cartilage or on the back of the hand, however, is almost always referred to the surgeon because of the danger of dam-

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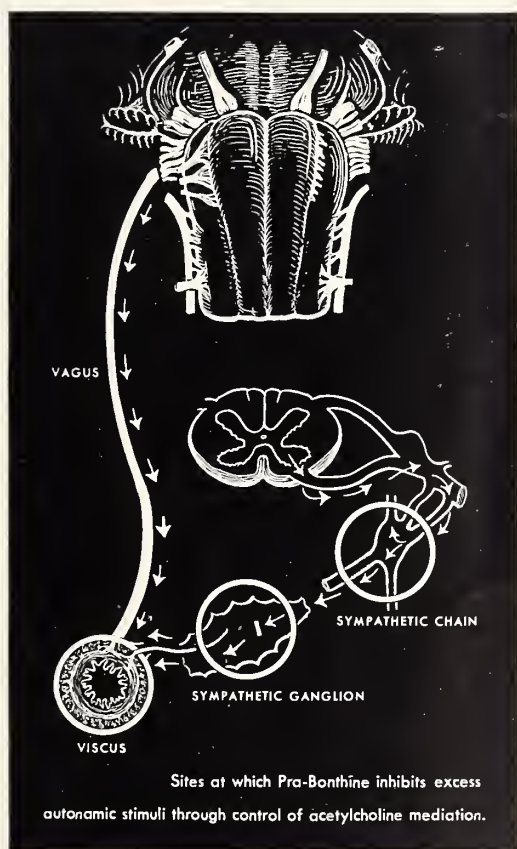
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1. Schwartz I. R.; Lehman, E.; Ostrove, R., and Seibel, J. M.: *Gastroenterology* 25:416 (Nov.) 1953.

2. Roback, R. A., and Beal, J. M.: *Gastroenterology* 25:24 (Sept.) 1953.

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aging adjacent tissues with the dose of x-ray required for treatment.

I would agree that many small basal cell cancers can be treated just as well by the surgeon as by the radiologist and perhaps treated more easily. I think the scar resulting from surgery is usually more obvious than that produced by the radiologist. With either treatment, a cure may be expected for most lesions.

Student: Dr. Robinson, would you biopsy a carcinoma of this sort before you treat it, or would you excise it and call the excision the biopsy?

Dr. Robinson: Whenever the lesion is small and we are reasonably sure what it is, we prefer to do an excision biopsy and be done with the matter at once. But when there is doubt about the diagnosis, as there is in this case, it is better to establish the diagnosis by biopsy, even at a time when there is fear of spreading the tumor, because the difference in treatment can be marked. However, there are instances in which we elect not to do incision biopsies.

For example, by aspiration biopsy of tumors in the parotid region, we have been able to prove the diagnosis often enough to think that we are justified in using this procedure. Again, if one suspects a melanoma, one doesn't like to do an incision biopsy for fear of spreading the cells via the blood stream. When the differential diagnosis rests between basal cell and squamous cell carcinoma, I think it is justifiable to take a piece off the side, including some normal tissue, so that sections will show what type of cells are growing actively at the edge of the lesion. In this patient I think biopsy was certainly justified; if we had thought that this was a squamous cell carcinoma, we would have assumed that the lesion on the jaw probably was a metastasis and our treatment would have been in error.

Dr. Johnson: I think that if the information that is obtained from biopsy will alter the choice of treatment, then biopsy should be done. At the Ellis Fischel Hospital, we don't hesitate to biopsy a suspected melanoma because, if the lesion proves to be a melanoma, the treatment will be different from that for a basal cell or squamous cell carcinoma. If the lesion is small enough, we do an excision and primary closure; but if it is large and would require a deep incision for removal, a piece is taken from the edge.

Dr. Friesen: This, at least, is one case in which initial impressions are misleading and treatment might have been more radical than necessary if the diagnosis had not first been established by biopsy. This case illustrates the fallacy of assuming that two lesions, occurring in the same patient at the same time, are necessarily caused by a single disease.

CHAMBER OF COMMERCE POLICY

A study of medical care for veterans was advocated by the United States Chamber of Commerce at the close of its recent meeting. Policy declarations of the organization are published in book form, and the book this year, in a chapter headed "Economic Security," includes the paragraph below.

"The federal government provides for the medical care of veterans through federally owned and operated hospitals and salaried physicians. The rapid expansion of the veteran population and the extent to which services are rendered to veterans with non-service connected disabilities justify a searching re-evaluation of the entire program. A definition of 'beneficiary' that is just both to the veteran and to the nation as a whole is urgently needed."

TELEVISION PROGRAMS ON THE EYE

Two new television "script-with-film" programs featuring current health education information on the eye and its functions have been released by the A.M.A. for use by county medical societies. Requests for the films and scripts are to be addressed to the A.M.A. Television Film Library.

"A Clear Picture" is the title of the program devoted to the structure of the eye, and "Wonderful Spectacle" describes the functions of glasses and lenses. Either can be used as a separate 15-minute program or the two may be combined for a single presentation. Dr. Brittain F. Payne, New York ophthalmologist, is the film demonstrator.

GRANTS FOR HEART RESEARCH

In the first decade of its existence the Life Insurance Medical Research Fund has given more than \$7,000,000 for heart research, according to a report issued recently by the Institute of Life Insurance. Awards for 1955 total \$929,400 and include \$5,500 to the University of Kansas School of Medicine for research by Dr. Kenneth E. Jochim on effects of arteriosclerosis on arterial circulation.

What is to happen to the derelicts? Although tuberculosis occurs in any type, level or stratum, there are people especially prone—the dispossessed and the defeated, the disintegrated and the defenseless. The teacher who cannot get a job because of some x-ray shadow; the young man excluded from industry; the man who finds he cannot enter any superannuation scheme because of a past history of tuberculosis—what are we to do with them?—*Harley Williams, M.D., Nat. Tuberc. A. Tr., May, 1954.*

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PHYSICIANS' ACTIVITIES

Dr. Paul H. Lorhan, of the University of Kansas Medical Center, was an instructor on the subject of "Geriatric Anesthesia" at a November meeting of the American Society of Anesthesiology in Boston. He also participated in two panel discussions.

Dr. Glen Q. Street, Jr., Wichita, has been appointed part-time medical and psychiatric consultant for the Wichita Recovery Center of the Kansas State Commission on Alcoholism.

The Kansas Division of the American Cancer Society announces that **Dr. J. P. Berger**, Wichita, is now serving as its president.

Dr. Mary T. Glassen, Phillipsburg, was recently re-elected president of the Kansas Council of Children and Youth.

The appointment of three new health officers was recently announced: **Dr. Marita Scimeca**, Kiowa, for Barber County; **Dr. James E. Henshall**, Osborne, for Osborne County, and **Dr. Willard F. Werner**, Tribune, for Greeley County.

Dr. George W. Jackson, director of state institutions, Topeka, was recently named to membership in the Central Neurology and Psychiatric Association.

Dr. Richard F. Looker, Wichita, addressed the Hillsboro Kiwanis Club last month on the subject of "Advances in the Diagnosis of Heart Disease."

Dr. Frederick A. Gans, Salina, has been elected to membership in the American Academy of Pediatrics.

Dr. W. G. Cauble, Wichita, is the author of a paper, "Acute Abdominal Pain in Polycythemia," published in the October issue of *American Surgeon*.

Dr. William Aldis, who has been practicing in Corpus Christi, Texas, since his release from the

Navy, has joined the staff of the Newman-Young Clinic in Fort Scott. He is a brother of **Dr. John Aldis** and **Dr. Henry Aldis**, also of Fort Scott.

Dr. Austin J. Adams spoke on "Functioning in the Field of Mental Health" at a recent meeting of the Wichita Lions Club.

Dr. William L. Valk, of the University of Kansas Medical Center, participated in a panel on renal lithiasis at a meeting of the American College of Surgeons in Chicago in November.

A talk on the diagnosis of different kinds of tumors was made to the Emporia Kiwanis Club recently by **Dr. Walter E. Luedtke**, Emporia.

Dr. Tom Taylor, formerly on the staff of the sanatorium at Norton, began a residency in internal medicine at the Veterans Hospital in Denver on January 1.

Dr. V. J. Brown was discharged from the Air Force last month and has returned to his practice in Wichita.

Dr. Richard H. Claiborne, who has been on the staff of the Parsons State Training School during the past six months, has moved to Baxter Springs and is establishing a practice there. He was graduated from the University of Kansas School of Medicine in 1953, served his internship at William Beaumont Army Hospital in El Paso, and then spent a year as a medical officer at the White Sands Proving Ground, New Mexico.

Two Wichita physicians, **Dr. Mary J. Blood** and **Dr. William F. McGuire**, recently became fellows of the American Academy of Pediatrics.

Dr. Robert E. Bodmer, who formerly practiced in Coldwater, is now taking a year's residency in internal medicine at the University of Kansas Medical Center.

Dr. John L. Lattimore, Topeka, spoke on methods of diagnosing cancer and leukemia at a meeting

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of doctors of the Hiawatha community on November 30.

Dr. John Fulton and **Dr. Alfred Tocker**, Wichita, were speakers at a meeting of registered nurses held in Wichita last month under the sponsorship of the Wichita-Sedgwick County Health Department. The subject was "Management of Tuberculosis Patients from Medical, Surgical, and Nursing Viewpoints."

Dr. Karl Menninger, Topeka, was recently honored by the National AmVets organization when he was presented its fourth annual rehabilitation award for his service to veterans.

Dr. William Dodson, formerly of Kansas City, Missouri, is now practicing in Ulysses in association with **Dr. Marshall Brewer**.

Dr. Charles E. Henneberger, Atwood, has been named coroner of Rawlins County to replace **Dr. Kenneth L. Knuth** who is moving from the county.

Dr. Charles B. Replogle, who has been practicing in Ellis, moved to Great Bend last month to practice in association with **Dr. Donald A. Kendall**. Dr. Replogle was graduated from the University of Kansas School of Medicine in 1952.

Dr. Edgar Johnson, who formerly practiced in Kansas City, Missouri, has opened an office in La-Cygne.

Dr. Harlan W. Berthelsen, who formerly practiced in Moline and McPherson, is now practicing in Howard.

COUNTY SOCIETIES

Dr. Charles S. Joss will serve as president-elect of the Shawnee County Medical Society as the result of an election held in Topeka on December 6. Dr. Clyde B. Trees, who took office as president at that meeting, will be assisted during the coming year by the following: Dr. Dwight Lawson, vice-president; Dr. Clovis Bowen, secretary; Dr. James McClure, treasurer. Dr. Dale Dickson has begun a three-year

term on the board of directors, as has Dr. Lucien R. Pyle on the board of censors. Two, Dr. William O. Martin and Dr. Robert H. O'Neil, have started two-year terms on the medical service board.

The meeting, at which the doctors' wives were guests, included a dinner, a floor show, and dance. Membership in the 85-50 club, composed of physicians who have reached 85 years of age or have been in practice for 50 years, was conferred on Dr. C. S. Smith of Rossville and Dr. W. W. Reed.

Dr. Frank F. Allbritten, Jr., chairman of the department of surgery at the University of Kansas Medical Center, was guest speaker at a meeting of the Sedgwick County Society held in Wichita on December 6. His subject was "Cancer of the Lung." In the afternoon he conducted a clinic at St. Joseph Hospital with Dr. Edward S. Brinton and Dr. John G. Shellito as moderators.

Officers of the Montgomery County Society for the year 1956 were elected at a meeting held at the Coffeyville Country Club on November 16, and the following were named: president, Dr. William R. Beine, Coffeyville; vice-president, Dr. William G. Chappuie, Independence; secretary, Dr. Virgil E. Flanders, Coffeyville, and treasurer, Dr. Gerald C. Bates, Independence. The program for the evening was presented by Dr. James M. Mott, of the Kansas State Board of Health, who discussed skin testing for tuberculosis in school children.

Members of the Labette County Society and its auxiliary were guests of Dr. and Mrs. I. Joseph Waxse, Oswego, at a dinner at the Waxse home on November 9. Separate meetings were held later, and the speaker for the doctors' session was Dr. R. L. Ferguson, Joplin, who discussed "The Pathology of Lymph Nodes." The group elected the following officers for 1956: president, Dr. Arthur P. Burgess, Oswego; secretary-treasurer, Dr. V. L. Jackson, Altamont.

Thirty members of the Central Kansas Society were present at a meeting held in Russell on November 17. During the afternoon session Dr. John F. Thurlow, Hays, and Dr. Richard L. Dreher, Salina, presented scientific papers. A business session was held after a dinner, and the following officers were elected: president, Dr. John C. Artman, Hays; vice-president, Dr. Frank A. Dlabal, Wilson, and secretary-treasurer, Dr. Rex C. Belisle, Hays.

Dr. Donald E. Ray, Chanute, was elected president of the Neosho County Society at a meeting held at the Tioga Hotel, Chanute, on November 30. Dr.



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Edward E. Long, Humboldt, was named secretary-treasurer. The program for the evening, following a dinner meeting with the Auxiliary, consisted of a paper on mediastinal tumors by Dr. Vernon Berkey, Pittsburg.

Approximately 100 persons were present at a Christmas party for members of the Southeast Kansas Medical Society and their wives at the Columbus Country Club on December 8. Dr. Clarence H. Benage, Pittsburg, gave a short talk, after which a floor show was presented. The dinner menu was made up in medical style with scientific terminology for the different items served.

The regular meeting of the Wyandotte County Society was held at the Red Cross Building in Kansas City on December 20. Dr. Alvin Silvers spoke on "Hospital Pharmacies."

Dr. Robert O. Brown was elected president of the Atchison County Society at a meeting held at Atchison on December 6. The following were chosen to assist during 1956: vice-president, Dr. Arthur Whitaker; secretary-treasurer, Dr. Wayne O. Wallace; delegate to state meeting, Dr. Edwin T. Wulff; alternate, Dr. Wallace.

THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.

BACKWARD, TURN BACKWARD

To one whose memory goes back to the turn of the century or a little before, the harangue of the pitch men on radio and television as they hawk their medicinal concoctions is very similar to the old-time medicine shows which peddled nostrums guaranteed to cure most everything with which human beings are afflicted.

That was away back when Old Dr. Munyon, with his index finger pointing upward, Kickapoo Indian Sagwa, Payne's Celery Compound, and Sloane's Liniment, good for man or beast, was apt to be found in every medicine chest. In every drug store were Pink Pills for Pale People—now called vitamins and "guaranteed to make you feel better fast"—Glover's Hair Restorer, Sweet Caporal cigarettes with their risqué pictures, snuff, flaxseed poultices and Lydia Pinkham's Compound. The latter was for womenfolks

and its use was not fully understood by the boys who wondered why it was the only medicine with which they were not rubbed or dosed.

The Winchester calendars were in thousands of homes. Two big companies had a monopoly with Star and Horseshoe spitting tobacco until old Battleax plug came along and almost cornered the market with its cut price. For domestic treatments mom gave the kids pumpkin seed tea for worms, tied an old sock around their necks for throat, put an onion bag on their chests for croup and tied a bag of asafoetida about their necks to keep infectious diseases away.

Other standbys were Ayers Cherry Pectoral, good for whooping cough, croup, sore throat, colds and lung trouble peculiar to children. Dr. Owens Electric Belt, with its mixture of copper and zinc plates, was a cure for rheumatism, lumbago, nervous debility, sexual exhaustion and indiscretions. Piso's Cure for Consumption—now called tuberculosis—was a sure cure and could be administered without the help of a TB association, while Ely's Cream Balm was a cure for catarrh, hay fever, cold in the head and deafness, and cost only 50 cents. On the label of DeWitt's Little Early Risers was the assertion that "If you are not bright, these pill will make you so."

That was before the days of the medical specialist and a doctor did everything for \$2, win, lose or draw. But \$2 could be an extravagance then and no doctor was called so long as the patient was conscious and had been rubbed with so many things that he was liniment-logged when the doctor arrived.

One hesitates to think what the old-time doctor (?), with his Prince Albert coat, his stove-pipe hat and his long black string tie, standing on the platform of his free medicine show with a smoking kerosene torch at each corner, could do today if he could make his pitch over the radio or television. But be it said to his credit, he didn't act like a confidence man, put on a synthetic smile and wheedle his way into your home with a lotta bull, bunc and baloney.

—F. J. C., *Kingman Leader-Courier*, December 2, 1955.

NEVADA SOCIETY INSURES ATTENDANCE

A measure to increase attendance at its meetings was recently adopted by the medical society in Washoe County, Nevada, in the form of a by-law applying to all physicians on its roster. It reads, "Each doctor shall attend 50 per cent of the meetings of the Washoe County Medical Society, with the exception of doctors who are 50 years of age or older with 10 years attendance at the meetings, or 55 years of age with five years attendance." Penalty for nonattendance is \$100 with the possibility of suspension or expulsion for two consecutive years of nonattendance.

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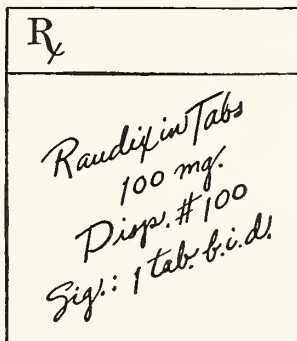
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*Ataractic, from *ataraxia*: calmness untroubled by mental or emotional excitation. (Use of term suggested by Dr. Howard Fabing at a recent meeting of the American Psychiatric Association.)



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DEATH NOTICES

THOMAS GROVER ORR, SR., M.D.

Dr. Thomas G. Orr, 71, professor emeritus at the University of Kansas School of Medicine, died on November 19 after suffering a heart attack. From 1924 to 1949 he had served as professor of surgery and chairman of the department of surgery at the school.

A graduate of Johns Hopkins University School of Medicine in 1910, Dr. Orr came to this area in 1915 and engaged in private surgical practice before affiliating with the medical school. He was a diplomate of the American Board of Surgery, a fellow of the American College of Surgeons, and a member of the American Surgical Association and the Western Surgical Association. He also served as editor of *American Surgeon*. During World War II he was an officer in the Army medical corps.

RAYMOND JOSEPH LEIKER, M.D.

A coronary occlusion on November 22 brought death to Dr. Raymond J. Leiker, 52, at his home in Great Bend. A member of the Barton County Medical Society, Dr. Leiker had practiced in Great Bend since 1937. He was graduated from St. Louis University School of Medicine in 1929 and began practice in Ellinwood in 1931, remaining there until 1937. He served in the Army medical corps during World War II.

BERT ELBA MILLER, M.D.

Dr. B. E. Miller, 75, a member of the Morris County Society, died at Council Grove on November 26. Had he lived until spring, he would have completed 50 years of practice in Council Grove, and the community was planning a "Dr. Miller Day" in his honor. He was a graduate of the University Medical College of Kansas City with the class of 1905.

RALPH R. CLUTZ, M.D.

Dr. Ralph R. Clutz, 78, who had practiced for 55 years, died at an Atchison hospital on November 30 after an extended illness. He was graduated from Kansas City Medical College in 1900 and began practice in Bendena in 1902,

remaining there until his illness. He had served two terms as health officer for Doniphan County. Dr. Clutz was an honorary member of the Doniphan County Medical Society.

LOUIS BOUCHER GLOYNE, M.D.

Dr. Louis B. Gloyne, 62, a physician in Kansas City for 37 years, died at Bethany Hospital there on December 8. He was graduated from the University of Kansas School of Medicine in 1918, served his internship at St. Margaret's Hospital in Kansas City, and then began private practice. In 1926 he went to Vienna for a postgraduate course in surgery.

Dr. Gloyne was active in medical society affairs throughout his professional life. He had served a term as president of the Wyandotte County Medical Society, of which he later became an honorary member, had been on the Council of the Kansas Medical Society, and had been a member of various committees. He was one of the organizers and a past president of the Kansas Academy of General Practice.

A son, Dr. Howard F. Gloyne, Kansas City, is among the survivors.

CHARLES HENRY LERRIGO, M.D.

Dr. C. H. Lerrigo, 83, an organizer of the Kansas Tuberculosis and Health Association, died in Sylacauga, Alabama, on December 4. He was born in England and came to Kansas in 1886. In 1900 he was graduated from the Homeopath Medical College in St. Louis, and in 1901 he opened an office in Topeka. His career in public health work began in 1905 when he was appointed to the Kansas State Board of Health, and he continued in that capacity for 18 years. The Kansas Society for the Study and Prevention of Tuberculosis was organized under his direction, and he served as one of its officers from 1908 to 1919. During World War I he served overseas as commanding officer of the Washburn Ambulance Company with the rank of major. In 1922 he became secretary of the Kansas Tuberculosis and Health Association, continuing in that position until his retirement in 1947 and as editor of *Health Education in Kansas* until 1952.

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Encephalomyelitis

The Problem It Presents in the United States

DALE W. ANDERSON, M.D., *Phoenix, Arizona*

INTRODUCTION

It is only recently that physicians have become interested in encephalitides as important disease entities. An analysis of factual knowledge concerning these diseases seems pertinent at present. Even though viral encephalitides have world wide distribution, the disease occurs with sufficient frequency in this country to limit the discussion to various aspects of encephalitis in the United States.

If one is to review encephalitis, certain basic premises must be understood. First, encephalitis is a descriptive term denoting a pathological or clinical syndrome which is unrelated to etiology. It is known that a number of infectious, toxic and allergenic agents are capable of producing an inflammation of the brain, i.e., encephalitis. In this report, the discussion will be limited to common infectious encephalitides defined as "Arthropod-borne virus encephalitides." The encephalitides arising secondarily from infections such as mumps, measles, vaccinia, and influenza, or resulting from toxins and allergens, will not be discussed. Poliomyelitis will be considered only from the viewpoint of differential diagnosis.

HISTORY

Reports of epidemics of encephalitis have appeared since 1871. In 1934, Hayashi isolated a viral agent during one of these epidemics. The disease entity he was studying is now known as Japanese B. encephalitis.¹

In 1917 and 1918, an epidemic in Australia brought the problem to world notice when J. B. Cleland and collaborators reported a disease entity called Australian "X" disease and proved an arthropod-borne neurotropic virus to be its cause. This disease is now known as Murray Valley encephalitis because of its prominence in this location, and it has been shown to be closely related to Japanese B Encephalitis.² In 1930, Meyer, Hering and Howitt, in the Central Valley of California, isolated a virus from the brain tissue of horses with encephalitis. Two years later Meyer reported the possibility that this virus might also be causing disease in humans.³

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Anderson is now serving his internship at Good Samaritan Hospital, Phoenix, Arizona.

Finally, in 1938, the virus causing the disease known as western equine encephalitis was recovered from human tissue by Howitt.⁴

In 1932 an epidemic of encephalitis was reported in Paris, Illinois. It reappeared in 1933 in St. Louis and Kansas City, Missouri. At this time Muckenfus, Armstrong and McCordock isolated the virus of St. Louis encephalitis. In 1933 Ten Broeck and Merrill recognized encephalitis in horses in the eastern states,

SUMMARY

It has been pointed out that the arthropod-borne encephalitides are important because of increasing public interest, lack of trained personnel to control local epidemics, and an epidemiology which is not clearly understood. The encephalitides may become more prevalent because of increased vector population stemming from development of agricultural irrigation projects in endemic areas. Clinical aspects of the problem such as diagnosis, treatment, and prognosis have been discussed with emphasis on methods by which the clinician and specialized personnel may cooperate with one another. The clinician can cooperate best by reporting his patients and making available material for immunological studies. This enables the specialist to enlighten physicians as to the epidemiology and future control of the encephalitides.

and in the same year Sittner and Shakan isolated the virus from horses.¹ Then in 1938 Fothergill and collaborators⁵ first isolated the virus of eastern equine encephalitis from a human patient, and soon afterwards Webster and Wright⁶ isolated the virus from another human being.

Simultaneously with these discoveries, other arthropod-borne viruses were incriminated as causative agents of encephalitis in many parts of the world. At present, almost every geographical area has a particular viral disease entity such as Venezuelan equine encephalitis, Russian far eastern encephalitis, west Nile encephalitis, and louping ill in the British Isles. Only eastern equine, western equine, and St. Louis

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encephalitis are of major importance in the United States.⁷

CLINICAL PICTURE

In the encephalitides, there are no signs or symptoms which enable one to distinguish between various types. At the onset, many of the signs and symptoms are systemic in character and mimic those commonly associated with an upper respiratory infection. Therefore, only in those geographical areas during the season when the disease is endemic or epidemic does the clinical picture have definite meaning to the clinician first seeing the patient.⁸

Cases may be divided into clinical and subclinical entities. Clinical cases are either abortive, mild, or severe. The disease progresses through various phases: prodromal, acute febrile, and convalescent. The onset may be violent or insidious. The incubation period is estimated to vary between 4 and 21 days. Initially, during the first four days, the only symptoms may be headache, tinnitus, malaise, gastrointestinal disturbances, drowsiness, and mild fever.¹ Additional symptoms which may appear the third or fourth day are muscle pains, conjunctivitis, photophobia and nuchal rigidity.⁹ At this time restlessness and irritability are seen commonly in children.¹⁰

An abortive case may occur in which the above symptoms are the only ones to be detected. In such an instance the clinician could only speculate as to the cause. However, the disease process may progress to the acute febrile phase which lasts from one to three weeks and consists of increasingly high fever ranging from 101° to 106° F. with development of a fluxuant, changing neurological picture. Prominent symptoms include severe headache, lethargy, vertigo, and mental confusion.

Among the neurological signs which are extremely variable are tremors, stiff back, diplopia, reflex changes, paralysis, delirium, convulsions, stupor, and coma.¹¹ In one study involuntary tremors, particularly in the hands in adults, occurred in 50 per cent of the cases.⁸ Paralysis occurs only in approximately 15 per cent of the cases.¹ Convulsions which are common in children are usually of the grand mal type. However, in adults, the Jacksonian type of convulsion predominates.¹¹ In infants one may see a tense fontanelle and cyanosis.¹⁰ The relative frequency with which these signs and symptoms may occur is seen in Table I.⁸

LABORATORY FINDINGS

In encephalitis, positive routine laboratory data are obtained by studying patients' blood and spinal fluid. The findings give no indication as to the type of encephalitis or its severity.¹¹ Commonly, there is an increase in the white blood cell count to a level varying from 10,000 to 16,000 per cu. mm. in which 70

to 90 per cent are polymorphonuclear leucocytes. Lymphocytes may increase in the later stages of the disease.¹² In one study, there was indication that a lymphocytic rise does not occur readily in individuals

TABLE I

The Incidence of Signs and Symptoms in 66 Cases of Encephalitis in Central Valley, California During 1945, 1946, 1947.⁸

<i>Signs and Symptoms</i>	<i>Frequency (No. Cases)</i>
Fever	66
Headache	51
Nuchal Rigidity	47
Lethargy or Drowsiness	41
Nausea and Vomiting	38
Stiff Back	31
Tremors	30
Restlessness	28
Reflex Changes	26
Mental Confusion	21
Convulsions	18
Stupor	12
Paralysis (partial)	12
Diplopia	9
Delirium	7
Vertigo	6
Coma	6
Dysarthria	2
Urinary Retention	1

under two years of age.¹¹ In 1938, during an epidemic of eastern equine encephalitis in Massachusetts, white cell counts ranged from 14,600 to 65,900, but all patients with cell counts above 35,000 were found to have pertussis.¹⁰

Spinal fluid studies are helpful to the clinician. The spinal fluid may have a "ground glass" appearance with an increased white cell count within the first two days of the illness in 90 per cent of the cases. The number of cells may vary from 25 to 1,000 per cu. mm. Counts over 200 are rare, and counts less than 100 are found in the majority of cases.⁸ Polymorphonuclear leucocytes usually predominate, varying from 50 to 75 per cent with a later increase in lymphocytes the second or third weeks of illness.¹² No red blood cells are seen. Initially the total protein can be normal or slightly elevated. Most of the time there is a gradual increase of protein which does not exceed 100 mg. per 100 cc., the usual being 60 to 70 mg. per 100 cc.⁸ The globulin fraction is increased four plus.¹²

In a report of 42 cases of western equine encephalitis, Cohen et al. found the protein to be of normal concentration in 34 per cent and elevated in 66 per

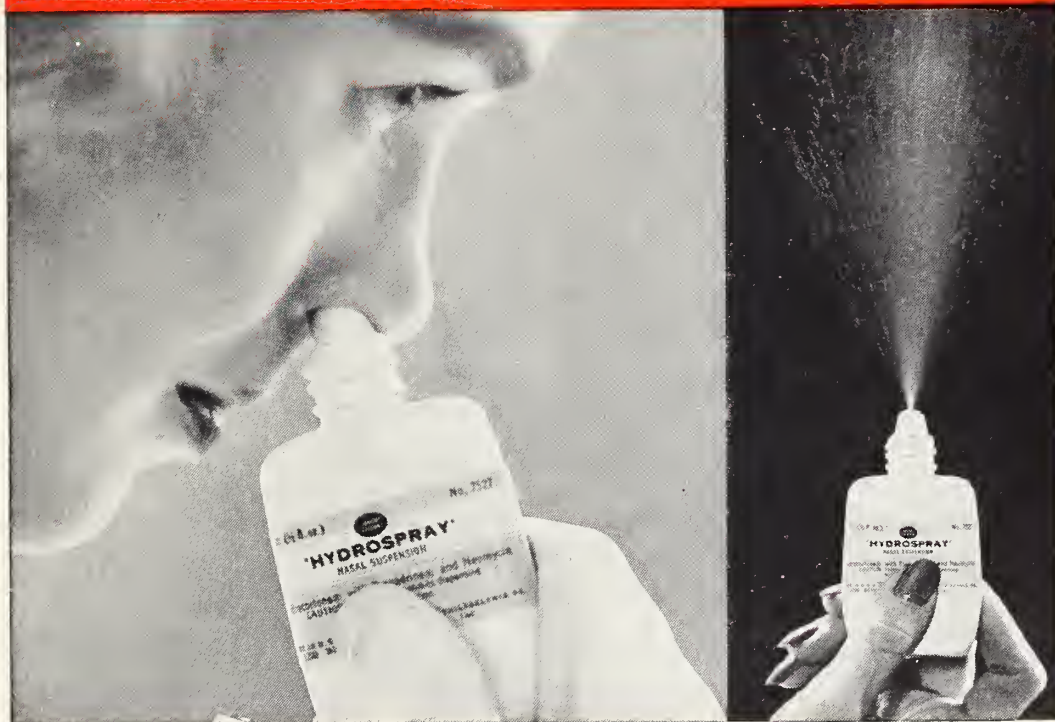
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REFERENCE: 1. Silcox, L. E., *A.M.A. Arch. Otolaryng.* 60:431, Oct. 1954,

cent of the cases.¹¹ Other spinal fluid findings such as sugar and a chloride determination and specific syphilitic tests will be normal. Colloidal gold may show minor abnormality if the protein content of the spinal fluid is high, but this is not a common finding.⁸

PATHOLOGICAL PICTURE

As in all viral diseases, the basic lesion appears in the infected cell. In encephalitis this cell is the neuron. The areas of the central nervous system in which lesions are most commonly found are thalamus, striate body nuclei, Purkinje and molecular cells of the cerebellar cortex, and the cerebral cortex.

In response to neuronal injury and death, microglia collect around the neurons forming microglial nests which can be seen upon microscopic examination. When damage is severe, these nests may coalesce and appear grossly as sharply demarcated spongy amorphous lesions of necrosing cellular material. Perivascular infiltration by lymphocytes is seen also. Calcium deposition in the brain parenchyma and blood vessel walls has been described in chronic cases, but this is rare.¹³

DIFFERENTIAL DIAGNOSIS

Differentiation among the various types of encephalitis is difficult and among the arthropod-borne encephalitides can be made only by immunological means. This requires long, specialized techniques not readily available to every clinician, so they are as yet of no practical therapeutic value.⁸ However, these techniques are of practical value in making a differential diagnosis. Meyer suggested cases of mild encephalitis might be diagnosed and reported inaccurately as non-paralytic poliomyelitis.¹² Headaches, fever, nuchal rigidity, and similar seasonal incidence occur in both poliomyelitis and the primary encephalitides. Lethargy or drowsiness are seen more often in the primary encephalitides, while lower motor neuron weakness with absent reflexes is seen more frequently in poliomyelitis. However, it must be remembered that in any deeply lethargic or comatose patient, reflexes will be absent. In general, absence of involvement of higher centers in the nervous system and predominance of spinal cord signs favor the diagnosis of poliomyelitis.⁸

Distinguishing between arthropod-borne encephalitides and encephalitides secondary to other infections rests solely on the presence or absence of a history of previous exanthem, vaccination, or on immunological studies. Secondary encephalitides as a rule occur in late fall, winter, or early spring months, while arthropod-borne encephalitides occur in late spring, summer, and early fall months.⁸

IMMUNOLOGY

The most important aspects in establishing a specific etiology in arthropod-borne encephalitides are concerned with serological studies on the patients' serum.⁸ Various attempts in isolation of the virus from blood, feces, and nervous tissue have been successful, but these types of studies are too detailed for routine use.¹⁴ The two serological studies which are used mainly are the complement fixation and the neutralization tests. The techniques of these tests are complicated, but in principle they are relatively simple.

The complement fixation test is based on the ability of a specific antigen-antibody reaction to fix known complement. When sheep red blood cells and specific antibody for these cells are added, hemolysis will result unless the complement has been removed by the previous antigen-antibody reaction.¹⁵

The neutralization test depends on the ability of a specific antibody to neutralize a virus when inoculated simultaneously into a susceptible host. Quantitative results are obtained by titrating known sera against unknown sera.¹⁶ These specific serological tests now are possible for eastern equine, western equine, St. Louis, Japanese B, Venezuelan equine, Russian tick-borne encephalitis and other encephalitides of viral etiology.⁸

It is important for the clinician to know how and when to obtain blood specimens for these tests. Positive diagnosis of active infection in a patient requires the demonstration of a significant rise in antibody titer in at least two blood samples. The first specimen should be drawn as nearly as possible after onset of the illness. The second specimen should be obtained from 7 to 21 days later, depending on duration of the illness and rate of recovery. If the duration of illness is short, the second specimen should be drawn seven days later; if the illness is long, the second specimen should be obtained at the height of the illness. The specimens should consist of 10 cc. sterile quantities of whole blood which should be kept at non-freezing refrigeration until shipment to the laboratory. Blood samples should always be drawn in suspected cases because of the importance for epidemiological studies and prevention of encephalitides, even though no practical therapeutic aid is gained from them.⁸

Immunological studies have revealed differences in antibody responses among the specific encephalitides. Both neutralizing and complement fixing antibodies begin to develop at the onset of the disease and reach a high titer at the end of the first week in western and eastern equine encephalitides.¹ In St. Louis encephalitis, the antibodies rise much more slowly and do not reach high titers for several weeks.¹² In Japanese B encephalitis, neutralizing

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antibodies appear from the third to 14th day of illness while complement fixing antibodies appear from the fifth day to the fifth month. There is some indication that neutralizing antibodies are present longer than complement fixing antibodies; the former may last from four years to life, the latter for only one to three years.¹ It is of interest that patients with Japanese B encephalitis may show an anamnestic response. Patients having only neutralizing antibodies present will show a considerable rise in complement fixing antibodies after a minimal stimulating dose of Japanese B vaccine.¹⁷

As an example of the results of the immunological studies on a series of suspected encephalitis patients, a report of 90 such cases in Kern County, California, occurring between June to September of 1952, is cited. Among the 90 cases studied, 42 had positive tests for western equine encephalitis, 4 for St. Louis, 9 for mumps encephalitis, and 35 were negative to all tests. The patients within the latter group were diagnosed as having either non-paralytic poliomyelitis or were presumed to have had some type of arthropod-borne encephalitis.¹¹ The percentage of positive results in the antibody studies reported by Howitt varied from 26 to 95.¹⁸ Negative tests are still to be explained in patients with clinical encephalitis. One could postulate that other viruses, not isolated yet, are the cause of illness in such patients. It is the author's suggestion that a virus related to the psittacosis-lympho granuloma venereum group could be incriminated in the above cases. Such a virus has been found as the etiologic agent of 16 epidemics of bovine encephalitis from 1948 to 1952 in the western United States.¹⁹

STATISTICS

Analysis of the reported vital statistics in the encephalitides can give the physician an idea as to the prognosis of his patient. The incidence of disease with reference to age and sex of the patients depends on environmental factors affecting exposure. There is no characteristic age or sex incidence for any one of these diseases; therefore, the greatest insight can be gained by analysis of the classical epidemics reported for each encephalitis. In general it can be stated that variation in fatality is partly dependent on age incidence, being greater in the higher age groups.²⁰

In western equine encephalitis, the majority of patients are males, 20 to 50 years of age, who work outdoors.¹ In recent small sporadic epidemics, the highest incidence has been in infancy, the lowest in the 5- to 12-year group, and a moderately high incidence in the 15- to 50-year group. In Pineal County, Arizona, in 1941 an epidemic consisting of 18 cases of St. Louis and western equine encephalitis was reported in which 50 per cent of the patients were under 1.2 or 1 to 2 years of age.⁹

The mortality rate in epidemics of western and St. Louis encephalitis appears to be between 5 to 20 per cent in the mid-west.²¹ A severe epidemic of western equine encephalitis reported in 1941 in North Dakota, Minnesota, and neighboring Canada, consisting of approximately 3,000 cases, had a mortality rate of 8 to 15 per cent.²² In a California epidemic of St. Louis and western equine encephalitis in 1952, consisting of 727 cases, 51 deaths were reported.²³

Epidemics of eastern equine encephalitis have occurred infrequently. The first reported epidemic occurred in eastern Massachusetts in 1938 with a total of 39 cases in which an over all mortality of 65 per cent was seen. Sixty-five per cent of the cases were in patients under 10 years of age with equal sex distribution.²⁴ A sporadic epidemic occurred in southern Louisiana in 1947 with a 70 per cent mortality rate. Of the 10 cases reported, 7 were in patients under 10 years of age. In 1951, an epidemic of 13 cases occurred in the Yaque River Basin in Canada. The majority of cases were in patients under 5 years of age with 9 deaths reported.²⁵

Statistics reported from countries other than the United States have been similar. Japanese B encephalitis in recent years is reported to have a mortality rate of approximately 28 to 35 per cent with the greatest age incidence in the 5- to 9-year old groups. Murray Valley encephalitis in Australia has a mortality rate of approximately 70 per cent, and the greatest incidence is in the 0 to 5-year group.¹ Russian Far Eastern encephalitis has a mortality rate of 30 per cent.²⁶

Buss and Eaton made a report of mortality rates of poliomyelitis and the encephalitides in Kern County, California, between 1941 to 1950. Their report showed that the mortality rates are similar, but the number of cases of poliomyelitis was greater than those of encephalitides. The great difference between poliomyelitis and the encephalitides lies in the sequelae or neurological residuals resulting from such infections. In poliomyelitis, sequelae consist of partial or complete paralysis of the lower motor neuron type, while those of the encephalitides consist of upper motor neuron deficit. Sequelae in the encephalitides appear in 10 to 40 per cent of cases, depending on the age group involved. Very young patients have more sequelae than those in older age groups.¹ Residuals consist of emotional instability, mental retardation, hydrocephalus, epileptiform seizures, tremors, weakness, Parkinsonism, and frank paralysis.⁹ Decerebrate rigidity has been reported.¹⁷ As in poliomyelitis, these sequelae are the most feared result of such infections.

TREATMENT

Specific treatment for the encephalitides has not been forthcoming as have antibiotics for bacterial

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infections. Therefore, therapy is entirely symptomatic. Salicylates should be used freely for control of temperature elevations.¹¹ There is no specific indication for the use of antibiotics or sulfonamides, because at present, no antibiotic has been shown effective against viruses. These drugs should be used to control intercurrent infections. Convulsions can be controlled by the usual anti-convulsive drugs. Phenobarbital in one-half to one grain doses, three or four times a day, adding 32 to 65 mg. of dilantin one to four times a day as indicated, is usually adequate for control. The lethargic or comatose patient will require around the clock nursing care.⁸

Muscle spasm or spasticity can be treated with hot packs or a modified Kenny treatment. Spastic paralysis requires active and passive physiotherapy in severe cases.¹²

Maintenance therapy is of extreme importance. The physician should pay special attention to proper fluid balance, caloric intake, care of incontinence with indwelling catheters, and avoidance of decubitus ulcers by frequent movement of the patient.⁸ Ascorbic acid, even in large dosages, has been of little value.¹¹

Recently, because the utilization of ACTH and cortisone has produced some beneficial effects in acute allergic disseminated encephalitis, these hormones have been tried in the viral encephalitides.²⁷ Clinical and experimental evidence pointing to the fact that fatigue, chilling, or pregnancy lowers resistance and increases paralysis in poliomyelitis, has led to the thought that the stress reaction may play a part in the viral encephalitides. This has not proved to be the case, however, since both experimental and clinical studies with these drugs have produced negative results.²⁸

Immune serum has been given clinical trials, but it has proved valueless if it is begun after the onset of definite clinical symptoms. Passive immunization with specific anti-serum is being used experimentally in animals but not as yet in humans.¹² Active immunization with a formalinized inactivated virus is now possible. For several years veterinarians have used a formalinized chick embryo vaccine in horses, approved by the United States Bureau of Animal Industry.¹² Vaccination in horses has not appeared to reduce the disease in man.²⁰

Although vaccines are available commercially for eastern equine, western equine, and St. Louis en-

cephalitis, at present they are used only for people heavily exposed to these agents in the laboratory.²⁰ Public use is impractical because of cost, temporary immunity, and relatively low clinical attack rate as compared with inapparent infection rate.⁷ Practical vaccination does seem promising because Hammon has isolated a strain of virus which has the antigenic characteristics of western equine, eastern equine and St. Louis encephalitis viruses. From this finding he postulates that there is a stem virus from which these three viruses arose, and if the stem virus is found, this virus could be utilized for preparation of a vaccine for the three most prevalent encephalitides in the United States.²⁹

EPIDEMIOLOGY

All the arthropod-borne encephalitides have been found to have a common epidemiological pattern (not identical). The virus is transmitted to humans through an arthropod vector such as the mosquito. Ticks and mites have also been shown to be vectors. There is a correlation between the number of human cases, positive mosquito pools, and equine cases.⁸ Nearly every severe epidemic in humans has been preceded by an epidemic in horses in the same area. It is thought that the natural epidemiological cycle for these diseases is as follows:



Humans and equines enter the cycle accidentally.

The geographical distribution of the three viral encephalitides in the United States differs somewhat. Western equine encephalitis appears in all states west of the Mississippi River, as far east as Michigan in the north, and Alabama and Florida in the south. The virus has not been found in an area when it has not been present in the equine population also. St. Louis encephalitis is known to be present in the Pacific Coast area, the southwestern, and midwestern states. Our knowledge of its distribution is limited because of the lack of equine infection. Eastern equine encephalitis is distributed along the eastern seaboard to New England in the north, Florida in the south, and as far west as Michigan in the north and Texas in the south. Again, equines are helpful in the study of the virus.⁷ This is the only virus of the three reported outside the

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Temperate Zone.³⁰ Both western equine and St. Louis viruses are commonly found in the same states, but only four states harbor all three viruses: Texas, Alabama, Michigan, and Arkansas.³¹

Several features are common to all areas where the encephalitides are present. All have high summer temperatures with moderate temperatures in the winter and springtime.²³ Seasonal rains are heavy with intermittent flooding, or irrigation is common. Large numbers of mosquitoes are present at least every few years.²⁰ Epidemics appear when there are increased demands for irrigation or when heavy rainy seasons increase the vector population.⁸

The greatest incidence of infection is seen in small towns and rural and suburban areas while the centers of large cities are relatively free of these infections.²⁰ In antibody studies to detect subclinical infections, the highest incidence of antibodies is found near towns, with decreasing numbers of positive sera being found as one moves away from the towns.²⁵ It was also noted that the number of positive serums among normal individuals increased with extended residency in the endemic areas but not with age.²⁰ Positive sera for more than one virus and poliomyelitis were obtained in numerous persons.¹⁸

Vectors for the encephalitides consist of blood-sucking arthropods. Three genera of mosquitoes, *Culex*, *Aedes*, and *Culiseta*, have been incriminated. *Culex* is the genus considered most important in the United States.⁷ Bird parasites such as ticks, mites, and lice harbor the virus. Although mites have not been studied extensively, they are interesting in that the virus is transmitted trans-ovarially in chicken mites.³⁰

Much energy has been expended in the search for a natural reservoir host for the viruses. During the search many wild and domestic fowls and mammals have been incriminated by antibody studies. Among animals shown to have antibodies present are chickens, ducks, doves, pigeons, English sparrows, cowbirds, blackbirds, pheasants, squirrels, rabbits, and horses. From this evidence, it appears that birds are the most important vertebrate reservoirs for viral agents causing encephalitis. It is of interest to note the low incidence of antibodies in animals studied in the midwest, as opposed to other areas.³⁰ This may be an indication that the true reservoir host in the midwest has not been found.³²

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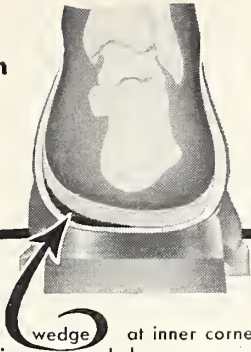
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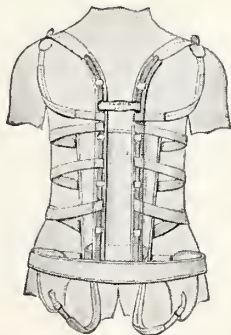
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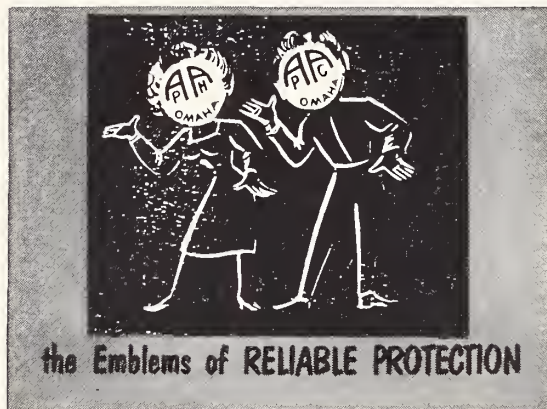
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TABLE OF CONTENTS

FEBRUARY, 1956

Scientific Articles		Clinicopathological Conference—The Differential Diagnosis of Nephrosis	75
Catarrhal Otitis Media—Joseph A. Budetti, M.D., and Ernest M. Seydell, M.D., Wichita	59	Senior Thesis—Psychomotor Epilepsy	96
Bronchography with Dionosil—Alfred M. Tocker, M.D., Wichita	62	Editorials	
Solitary Mesothelioma of the Pleura: Report of a Case—Albert E. Bair, M.D., William J. Reals, M.D., and Paul H. Wedin, M.D., Wichita	65	Our Centenarian	71
Fibroma of the Spermatic Cord—Marion A. Throckmorton, M.D., Halstead	68	Reducing the Budget	71
		Science Fairs	72
		Miscellaneous	
		President's Page	70
		Just Browsing	74

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Catarrhal Otitis Media

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Reports of ever increasing prevalence of non-suppurative fluid in the middle ear continue to be published. In all climates, catarrhal or serous otitis media is showing the same increase in prominence. The disease is described in the literature as acute, subacute, and chronic, phases which blend almost imperceptibly with one another. For the purpose of definition, however, the chronic phase may be described as the stage of desperation of the physician as the accepted remedies for the acute phase fail.

The classic explanation for fluid in the middle ear is generally accepted as follows: eustachian tube obstruction produces negative pressure in the middle ear due to absorption of air by the tissues. The negative pressure, in turn, produces vascular dilatation and transudation of sterile serum into the middle ear.

The principal etiologic factor in most catarrhal otitis medias is eustachian tube obstruction. Several principal groups of predisposing factors may be enumerated. Any lesion obstructing the ventilation of the middle ear may be the offending agent. In children, hypertrophic nasopharyngeal lymphoid tissue is probably the most common factor. Because of current success with antibiotic treatment of acute adenoid and tonsil infection, there has been a dangerous trend to procrastination of adenoid removal without regard to the long range effect on ears and hearing. The child who "won't pay attention" to his parents' call or teachers' talk, the child who keeps turning up the volume of the radio or television speaker is a real problem requiring careful study. The adult or young middle aged person who can't understand why his hearing is slipping away may have been saved this disability by prophylactic adenoidectomy in childhood.

Nasopharyngeal tumors must not be overlooked in adults. Scars or adhesions from traumatic adenoidec-

tomies, severe posterior septal deviations, and paralysis of the tensor veli palatini muscles are among the local lesions in the nasopharynx which may cause eustachian tube obstruction.

Mandibular fractures, mal-occlusion, and overbite are dental factors which tend to cause fluid in the ear.¹ Contrary to common belief, temporomandibular

A discussion of the etiology, symptoms, and diagnosis of otitis media, with suggestions for its prophylaxis and treatment.

joint syndrome with eustachian involvement can occur even when the rear molars are present.

Acute or chronic infections of the nose, sinuses, or pharynx frequently cause poor middle ear ventilation by spreading to the eustachian tube mucosa. A purulent postnasal discharge can affect the head, throat, esophagus, lungs, or stomach—why not the ears?

Perennial vasomotor rhinitis or specific nasal allergy are the most common predisposing agents in adults and may be difficult to control. The boggy tumescence of the posterior tips of the turbinates can simulate the effect of tumor or nasopharyngeal fibromas. Endocrine factors such as hypothyroidism may be easily overlooked. An interesting point brought out by Suchs² is that almost all the large series of catarrhal otitis media cases are reported by physicians residing in low, humid areas. Improper nose blowing and sneezing may prolong the symptoms, if not actually precipitate them.

Low grade infections of the mucosa of the eustachian tube, frequently secondary to virus infection in the nose or throat, cause stimulation of the mucous

glands of the eustachian tube and exudation of bacterially sterile mucus into the middle ear. Explosive nose blowing may force nasopharyngeal mucus into the eustachian tube.

The apparent increase in the incidence of serous otitis media may be due to increased awareness on the part of physicians and the apparent general increase in virus infections, but it most probably is due to a relatively new phenomenon or the abortive action of antibiotics on purulent middle ear infections. Maxwell³ recently expressed this thought quite aptly when he said, "Inadequate antibiotic therapy by means of ill chosen preparations, insufficient dosage, or premature termination of treatment may favor a smoldering chronic infection. Hearing loss in children due to low grade chronic inflammation and resulting scar in the middle ear after apparent recovery from an acute infection is an example of undesirable results which may be obtained from this type of therapy."

Schenk,⁴ in describing the indiscriminate use of antibiotics in acute otitis media, said, "The ear mechanism does not necessarily return to normal merely because the fever is reduced and pain disappears." The frequency with which needle puncture-aspiration plus inflation is required in our office as part of the treatment to "open up" an ear after the infection has been overcome bears witness to the above statement.

At the 1955 session of the Kansas Medical Society, Dr. Theodore Walsh of Washington University and Barnes Hospital, guest speaker in otolaryngology, described his experience at Children's Hospital in St. Louis. As part of a recent project, 12 consecutive patients having otitis media and being discharged as cured were seen by the ENT resident for the first time on their day of discharge. All 12 drums were punctured with a needle and fluid was aspirated from the middle ear in each case. Since we know full well how some of these fluids become tenacious and adhesive, the implications of this short series can be shocking.

The symptoms of acute catarrhal otitis media are well known. There is a feeling of fullness or obstruction in the ear. Hearing loss is present and may be suddenly precipitated or relieved by yawning or blowing the nose. Head noises are frequently present and may be manifested by crackling or bubbling sounds in the affected ear. Vertigo is an occasional symptom.

Examination of the tympanic membrane may reveal extremely variable findings. The anticipated "fluid level" sign is rarely seen since most middle ears are completely filled rather than half filled with fluid. The drum is frequently retracted—even when fluid is present. Bubbles or a fluid level may sometimes be visible through the tympanic membrane.

The drum may be dull grey and lusterless—or it may show the yellow-amber transparency of the accumulated fluid through its tense area. The chalk-white line of the malleus may be flattened and thinned by the fluid pressure. On occasion the drum may appear almost normal, and yet diagnostic aspiration—based on history and obstructive symptoms—will obtain fluid from the middle ear. Conduction deafness is present with lateralization of the Weber test to the deafened ear on the use of the tuning fork.

Treatment of acute catarrhal otitis media has two objectives—the removal of fluid from the middle ear and the prevention of reaccumulation of fluid by treatment of the associated predisposing condition. As a general rule, the sooner treatment is started following the onset of symptoms, the shorter will be the course of the disease. If an infection is present in the nose and throat, it should be vigorously treated. Proetz treatments using shrinking solutions are of value in shortening the course of the nasopharyngeal infection.

Vasoconstrictors may be applied to the nasopharyngeal mucosa by jetomizers, sprays, or drops. Ephedrine, 1 per cent, or neosynephrine, 1/4 per cent, are the basic standards. Stronger solutions may fit appropriate cases. Ephedrine or propadrine are effective by mouth. Dilute cocaine may be applied by cotton tipped applicators directly to the tube orifices. Even vaporizers can be effective in some cases. Some writers advocate use of infra-red or short wave diathermy.

When no purulent discharge is present, eustachian tube inflations are part of the classical treatment. The Valsalva maneuver and politzeration are advocated by some. Direct catheterization of the eustachian tube has proved effective. Some writers consider it to be excessively traumatic to the eustachian cushion mucosa, and others consider it "old fashioned." In our hands it has proved to be an invaluable tool. We never hesitate to use this method and consider it far superior to Valsalva or politzeration.

The easiest and most rapid method of removal of fluid from the middle ear is by puncture of the drum with a 20- or 22-gauge needle and aspiration by any one of numerous gadgets or syringes. Some writers do a standard paracentesis with or without spot suction at the puncture site, especially when tenacious mucus is present. Inflation before puncture or aspiration helps clear the drum from the promontory of the middle ear. After puncture, it helps evacuate some of the residue of fluid. Local anesthesia is usually unnecessary but is satisfactory.

Needle puncture-aspiration is the method used in our office. It gives immediate relief which many times is permanent. If the ear canal and drum need cleaning, alcohol is used. A cocaine-camphor-carbolic tampon is applied to the drum for a few minutes.

The needle is inserted through the posterior inferior quadrant of the drum. Aspiration yields several tenths of a cc. of fluid which varies from a thin serous form to thick gelatinous form. The perforation of a drum heals in a matter of hours even after repeated punctures. Secondary infection is rare enough to be no problem. Some writers advise the insertion of a sterile cotton wick against the perforation to assist in subsequent drainage of fluid from the "mastoid cells," but this seems superfluous.

Aerotitis is the same disease as that just discussed, in a hyper-acute form. It is usually precipitated by rapid descent in aircraft in persons with obstructed eustachian tubes. The general treatment is the same as that for ordinary acute catarrhal otitis media, but immediate therapy is highly desirable. If treatment is instigated within two hours, relief is usually permanent. Treatment may be in the form of aspiration, Proetz treatment with strong vasoconstrictors, or inflations.

The best treatment is, of course, prevention. Flying should be avoided in persons with upper respiratory infections, sinusitis, hypertrophic nasopharyngeal lymphoid tissue, active nasal allergy, etc. All fliers and passengers should be adequately instructed in methods of shrinking nasal mucosa and inflating the middle ear if flying is unavoidable. The value of radium treatment to the nasopharynx was adequately demonstrated in World War II for those pilots showing recurrent aerotitis.

The transition from the acute stage to the chronic is almost imperceptible. The fluid becomes increasingly thick and tenacious, and the edema of the mucosa is replaced by fibrosis. Fibrous bands ultimately bind down the ossicles, the tympanic membrane becomes plastered to the promontory, and fibrous bands in the eustachian tube area produce strictures.

In the terminal stages, head noises may be the most distressing symptom. Conductive deafness is present and often irreversible. The tympanic membrane is dull, thickened, and retracted. It may be impossible to inflate the middle ear. In this stage, the prognosis is poor. The patient finally becomes adjusted to moderate deafness and head noises. Eustachian tube inflations, bougienage, and pneumomassage of the tympanic membrane may be done as long as the patient notices improvement after each treatment.

For the ill-defined subacute stage several other suggestions have been made in the literature. Hypertrophic nasopharyngeal lymphoid tissue must be removed by adenoidectomy and radium or x-ray therapy. This point cannot be stressed too strongly.

Nasal allergy should be controlled by desensitization, diet, etc. The incidence and influence of nasal allergies cannot be overemphasized. Dental abnormalities must be corrected. Occasional improvement has been noted following the use of autogenous vaccines made from the patient's nasopharynx. A writer recently advocated prolonged drainage of the middle ear by temporary implantation of a polyethylene tube through an ear drum puncture. Permanent perforations of the tympanic membrane have been advocated, but mastoid complication of this method must be assumed as a calculated risk. Simple mastoidectomies have been resorted to in a few cases. ACTH has been used by one of us (J. B.) successfully in a few vasomotor rhinitis cases that would not respond to other means.

In the treatment of chronic catarrhal otitis media, once again the keynote is prophylaxis. Acute attacks should be treated enthusiastically and predisposing factors eradicated whenever possible. The unhealthy tendency to postpone or avoid adenoidectomy in childhood because antibiotics cure acute attacks has been leading to many cases of potential conductive deafness in adult life. Fortunately the pendulum is swinging back to a sensible mid-point as most physicians realize the inherent dangers of chronic or subacute recurrent infections. Infections are cured but the congestion and hypertrophy remain to impinge on the eustachian tubes and predispose the "cured" child to premature deafness in his third and fourth decade of life. Tonsil and adenoid surgery is still the physician's best weapon for this prophylaxis.

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Every man has two educations—that which is given to him and, the other, that which he gives himself. . . . Indeed, all that is most worthy in a man he must work out and conquer for himself. It is that which constitutes our real and best nourishment.

—Jean-Paul Richter

Bronchography

Use of Aqueous and Oily Suspensions of Dionosil

ALFRED M. TOCKER, M.D., *Wichita*

The superiority of iodized oil (Lipiodol) as a medium for bronchography has been virtually unchallenged since its introduction in 1922.²⁰ However, the substance has a number of disadvantages. The more important of these are alveolar filling which often interferes with interpretation of the bronchogram, persistent visibility in the alveoli seen long after instillation and often interfering with interpretation of future chest roentgenograms, and liability to produce iodism.²²

Because of these disadvantages of Lipiodol, other media, in particular rapidly absorbing radiopaque water-soluble media, were developed. These, however, proved to be cough-provoking bronchial irritants necessitating tedious and time-consuming anesthetic techniques, with the inherent dangers of the anesthetic agents, and often resulted in unsatisfactory bronchograms.^{6, 7, 14, 16} As a result, the preference of Lipiodol as a contrast medium for bronchography continued unchallenged.

In 1952 a new type of contrast medium, Dionosil, was developed in England.^{4, 23} Reports from all sections of the world have since indicated that this contrast suspension is replacing Lipiodol to a large extent in many medical centers.^{1, 7, 10, 15, 24} Since its introduction into the United States in 1954, it has gained great popularity. After careful evaluation of 35 cases in which bronchography was performed with Dionosil,* I have come to use this product exclusively for bronchography, although it is conceivable that there are special cases in which Lipiodol would be the preferable agent.

Dionosil differs from other media in that it is a suspension (rather than a solution or iodized oil) of the n-propyl ester of 3:5-di-iodo-4-pyridone-N-acetic acid (propyliodone).²³ It is presented in two forms—aqueous (a 50 per cent w/v suspension in a buffered aqueous vehicle containing sodium carboxymethylcellulose as a suspending agent) and oily (a simple 60 per cent w/v suspension in peanut oil). Preference among our roentgenologists varies be-

tween the more viscid oily suspension and the slightly more irritating aqueous suspension, the latter being favored in most cases. Both forms are less viscous than Lipiodol.

In Dionosil the deficiencies of iodized oils have been overcome as follows: the ester is completely hydrolysed, absorbed into the blood stream, and excreted in the urine within a few days; and degradation does not extend to the liberation of iodides or

Dionosil, a recently developed bronchographic medium, is a safe contrast suspension with attributes at least equivalent to those of Lipiodol, with the significant advantages of rare alveolar filling and rapid disappearance from the lung.

iodine which might give rise to sensitivity reactions.²³

Advantages of Dionosil include the following:

1. *Rapid Disappearance from Lungs.*^{1, 4, 7, 10, 13, 17, 18, 19, 23, 24} Dionosil is eliminated by drainage, cough, and excretion through the kidneys²³—often within 24 hours, and completely in a few days (Figure 1). Bronchography may be repeated at any time.

2. *Infrequent Alveolar Filling.*^{1, 2, 4, 8, 9, 18, 23, 24} Significant alveolar filling is unlikely, even if coughing occurs. When alveolar filling does occur, absorption is not delayed. In two of our cases, alveolar filling persisted in pathological areas which were later removed surgically and diagnosed microscopically as showing chronic organizing pneumonia.

3. *Improvement in Detail.*^{2, 4, 10, 19, 21} The suspension is deposited on mucosal surfaces, outlining rather than filling the bronchi, thus giving superior visualization.

4. *Minimal Irritation.*^{3, 4, 8, 9, 11, 15, 23, 24} The oily suspension of Dionosil has almost no irritation; an aqueous suspension is slightly more irritant. Bronchoscopy by others³ and by me within a short time after the use of Dionosil revealed no evidence of irritation. Microscopic examinations of lung tissue excised shortly after bronchography with this contrast media have shown no deleterious effect.^{3, 9, 24} While some feel there is no need to postpone operation after bron-

* Prior to approval by the Food and Drug Administration for sale of Dionosil in the United States, the oily and aqueous Dionosil used in these cases was supplied to us for clinical study by Glaxo Laboratories, Ltd., of England through Picker X-ray Corporation, White Plains, New York.

The material in this article was presented in exhibit form at the Kansas Medical Society meeting in Hutchinson, May 3-5, 1955.

chography in these cases,^{3, 4} others,⁹ including this author, prefer to wait until the lung is clear of the contrast material.

5. *Ample Exposure Time for Films.*²¹ Shadows remain well defined for at least 30 minutes; thus the need for spot-films is eliminated. However, during this time the patient must not be permitted to cough vigorously.

6. *No Risk of Iodism.*^{1, 4, 9, 23} There is no breakdown to iodides or iodine in the body. The compound is completely hydrolyzed and eliminated entirely by the kidney. Iodine and iodide ions are absent in the urine.²³

7. *Safety in Tuberculosis Cases.*^{4, 5, 8, 12, 17, 19} Experience confirms that, provided the infection is controlled, use of Dionosil in bronchography is reliable and safe even in active tuberculosis cases with cavitation and positive sputum.

8. *Introduction by Any of the Presently Recognized Routes.*¹¹ The aqueous suspension may be introduced through an endotracheal catheter, by needle puncture of the cricothyroid membrane, or through the tracheal wall below the cricothyroid cartilage. The oily solution may be introduced by any of the above routes, as well as over the tongue.

9. *No Necessity for Special Radiographic Facilities.*^{3,}

4, 7, 8, 9, 16, 18, 24 The density of the compound permits satisfactory fluoroscopic examination and enables excellent films to be obtained with the usual exposures.

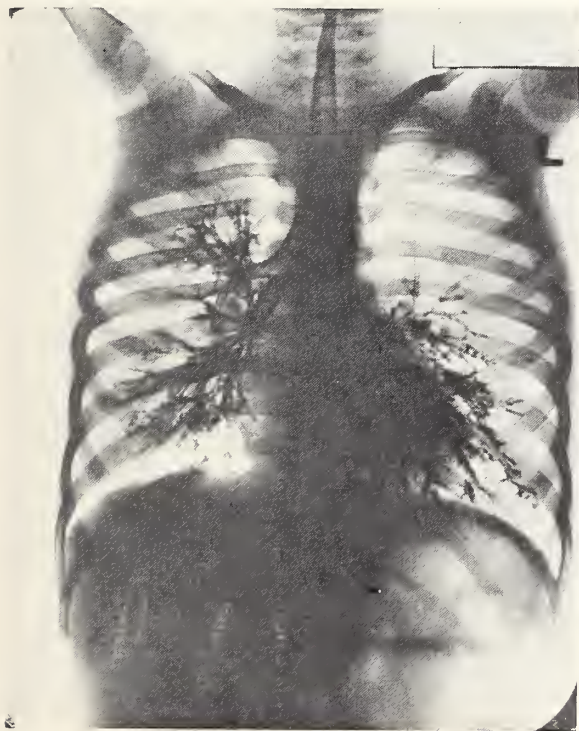
10. *Increased Scope of Bronchography.*^{3, 4, 9} Limitations imposed by earlier contrast media are removed.

The disadvantages of Dionosil, relatively few, include the following:

1. *Careful Anesthesia Required.*^{10, 18, 21} The suspensions (especially aqueous Dionosil) are slightly cough-provoking. In cases in which bronchoscopy and bronchography are indicated, we prefer cocaine topically as the anesthetic agent, anesthetizing both main stem bronchi with a 4 per cent cocaine spray through the bronchoscope. Immediately following bronchoscopy, the contrast material is introduced through a catheter passed through the nose into the trachea, which is less cough-provoking than a catheter passed orally.

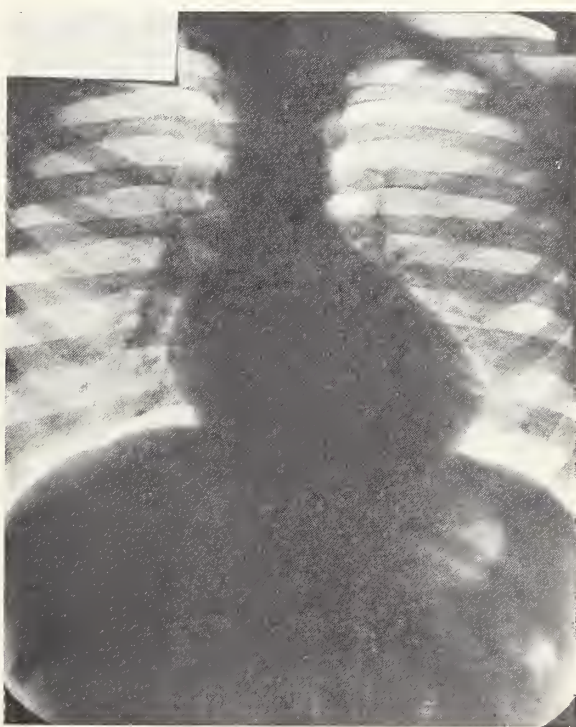
2. *Technical Difficulties in Handling Media.* The thickness of the suspension offers some technical difficulties. This is especially true of the oily suspension. The aqueous suspension, if permitted to dry, may "cake" on the tip of the syringe, interfering with injection.

3. *Pyrexial Reaction.*^{1, 4, 13} This occasionally follows the use of Dionosil, but is a comparatively rare



A

(A) Bilateral bronchogram of child with aqueous Dionosil showing excellent bronchial visualization.



B

(B) PA chest roentgenogram of same child taken 24 hours after bronchography showing lungs to be substantially clear of contrast medium.

condition. In one of my cases, the patient's elevated temperature fell to normal immediately after he coughed up a small white "plug," assumed to be Dionosil.

4. *Dyspnea*.^{1, 8} We believe that dyspnea has resulted in those patients in whom Dionosil was permitted to pool in the trachea or main bronchi, obstructing the respiratory passages. Our most severe reaction was in a physician who was dyspneic and complained of chest pains for several days following the bronchographic study.

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If you are to find rewarding satisfaction in your work, if your life is to be rich and purposeful and crowned with high achievement, it is important you continue to be a growing person. Education is a continuing process. It does not end with the termination of your schooling. Education continues from the beginning of life to the end of life, and balanced growth throughout one's entire life is important for every individual.

—Henry T. Maschal

Solitary Mesothelioma

A Case Involving the Pleura

ALBERT E. BAIR, M.D., *Wichita*, WILLIAM J. REALS, M. D.,
Wichita, and PAUL H. WEDIN, M.D., *Wichita*

Mesothelial tumors have been recognized as a distinct entity since 1936. Geschickter¹ used the term for a group of tumors previously known by 30 different names, e.g. endothelioma, celiothelioma, fibroma, fibrosarcoma, leiomyosarcoma, giant cell sarcoma of the pleura, endothelial sarcoma, and so on. The embryologic origin of mesothelium has been described elsewhere.²

Studies made in 1942 by Stout and Murray³ on mesotheliomas of the pleura served to fix the genesis of these tumors as mesothelial when Murray was able to explant the tumor in vitro and demonstrate that its cells imitated the behavior of normal mesothelial cells in vitro.

Three varieties of mesothelioma have been described.⁴

1. Malignant growths which are diffuse, grossly spreading, and microscopically characterized by anaplastic mesothelial cells forming tubules.

2. Solitary fibrous mesotheliomas. These may be pedunculated intrapleural growths or intrapulmonary with broad pleural attachments. Microscopically the tumor cell is elongated and spindle shaped and is associated with collagen and reticulin fibers. The arrangement is usually without definite pattern. There may be areas of increased vascularity, and when degeneration affects the tumor the collagen fibers are few. The intercellular spaces may be widened by fluid, and the cells may be rounded or stellate. In those considered malignant the histopathology reveals anaplasia. The cells are larger, stain more deeply, and mitotic division is more common. There are no collagen fibers and only extremely delicate reticulin fibers between the individual cells.

3. Benign mesothelioma of the male and female genital tracts. These are small nodules composed of tubules lined by cells that secrete a mucoid substance. There is controversy as to whether these are mesotheliomas or adenomas, adenomyomas or lymphangiomas.

Our attention was drawn to the second group by a case cared for by one of us (P.H.W.).

The patient, Mrs. J. S., a 56-year-old white female housewife, was admitted to the surgical service of Wichita-St. Joseph Hospital on October 11, 1953. Chief complaint was that of having a chest tumor. During a routine chest survey by the mobile photo-

Mesothelial tumors are an interesting though not fully understood group of tumors. Correlation of the microscopic structure and the clinical course may be difficult. A case of solitary mesothelioma of the pleura is reported, and the literature is briefly reviewed.



Figure 1. The shadow of the tumor is seen at the left base, occupying most of the space between the heart and the chest wall in the antero-posterior view. Lateral views showed it to be in the anterior portion of the chest.

fluoroscopic unit of the Kansas State Board of Health, a chest tumor had been found. The family physician

had recommended immediate hospitalization and possible surgical exploration. Physical examination revealed no significant findings. Careful physical examination of the chest revealed no abnormalities.

The initial laboratory studies revealed a total erythrocyte count of 4,370,000 with 12 grams of hemoglobin. The differential count was 72 per cent polymorphonuclear leukocytes and 28 per cent lymphocytes. Urinalysis was negative and a VDRL test for syphilis also was negative. X-ray examination of the chest on October 11, 1953, revealed a 2.5 cm. discrete nodule in the left basal area (Figure 1). The mass was seen to lie forward on lateral views and had no association with the pericardium. The lung fields were otherwise clear, and the heart was not enlarged. The radiologist concluded that the nodule was of indeterminate nature, primary alveolar neoplasm or granuloma to be excluded.

On October 12, 1955, the patient was subjected to an exploratory thoracotomy. The left thorax was opened through the fifth interspace. When the lung was exposed a tumor was seen attached to the inferior surface of the pleura of the left lower lobe. A wedge excision was carried out. Frozen section was reported as "benign." The wound was closed in a routine manner with an indwelling catheter for drainage. On the sixth postoperative day following an uneventful recovery the patient was dismissed.

Pathological examination of the material revealed an oval mass which measured approximately 4 x 3 x 2.5 cm. The outer surface was covered by a rather thick capsule, and attached along one margin was a small appendage which consisted of pulmonary tissue. The mass appeared to be arising directly from the surface of the lung and apparently involved the pleura. On section the cut surface of the mass was light red to pink in color and whorled. Tissues on



Figure 2. Gross appearance of the excised tumor, after it was divided. The cut surface was light red to pink in color, and the tumor had a rubbery consistency.

section were rubbery and cut with increased resistance (Figure 2).

Microscopic sections of the tumor removed from the pleura showed a cellular mass composed throughout of spindle shaped cells arranged without definite pattern. In many areas the tumor was producing collagen, and in these zones the cells were scattered throughout the collagen. In other areas the collagen was relatively scanty and the nuclei were prominent. Irregular spaces which varied in size were seen, and these were lined by spindle cells. In one area there appeared to be hyalin-like changes. Evidence of epithelial cells was not found (Figure 3).

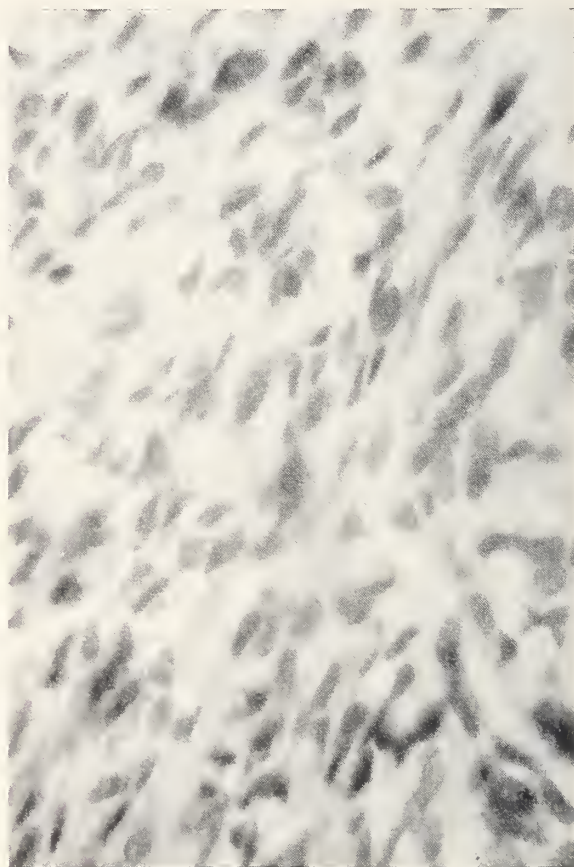


Figure 3. Photomicrograph of the tumor showing spindle-shaped cells, with no definite pattern for their arrangement. (x 740)

Diagnosis: Solitary mesothelioma of pleura.

The material was examined by Dr. Arthur Purdy Stout⁵ who concurred in the diagnosis.

The patient was seen October 10, 1955, and was in good health.

Stout and Himadi⁶ have reported eight cases of solitary localized mesotheliomas of the pleura, three of which were considered benign and five malignant.

Their longest period of observation was five years.

To these Benoit and Ackerman⁷ have added six cases diagnosed as benign. Their longest period of observation was eight years. They have also included in their analysis three cases of Brown and Johnson,⁸ all of which have had a benign course, one patient still living at 20 years. It should be noted that the latter authors considered their three cases as originating as a consequence of organization of interlobar effusions. They felt that two types of reacting cells entered into the genesis of their tumors, fibroblasts and mesothelial cells, both participating and either dominating the final picture to produce a variety of patterns.

Bogardus et al.⁹ report four cases, three of which were solitary. Periods of observation have not been long enough to evaluate clinically. Two of these were microscopically malignant and one was benign.

Clagett et al.¹⁰ have reported 24 cases of localized mesothelioma and do not feel that they have had, as yet, enough experience to classify them as benign or malignant. They reported one patient dying of recurrence five years after operation and one dying ten years after operation.

These authors add to the usual microscopic description their most significant finding, the presence of spaces or gland-like cavities lined by spindle cells.

In our review of the recent literature we have gained the impression that reported observations of patients having solitary, localized mesotheliomas have not been for a sufficient length of time to correlate with any degree of accuracy the pathological picture and the final clinical outcome. We, therefore, decline to classify our case as benign or malignant until it

has stood the test of time, even though it readily fits the description both clinically and morphologically of those tumors considered benign.

CONCLUSIONS

The classification of solitary, localized mesothelioma as to its state of benignancy or malignancy is as yet a precarious undertaking. The term "five-year cure" cannot be taken as a valid criteria for the favorable outcome of any specific case.

Pathologic findings both grossly and microscopically have not been found to correlate to a great degree of accuracy with the final outcome of solitary mesothelioma of the pleura.

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All of us are here today, alive, because at many junctures in history our forefathers—undismayed by the particular fears which haunted their times—took courage from faith and transmitted faith down through succeeding generations to us. . . . Only faith is truly and invincibly strong and viable.

—Lewis L. Strauss

Fibroma of the Spermatic Cord

MARION A. THROCKMORTON, M.D., *Halstead*

Fibromas of the spermatic cord are rare tumors, this being the 35th one reported. Since 30 per cent of spermatic cord tumors are malignant, and sarcomatous changes may develop in benign lesions, surgical removal is advised for all such tumors.

No fewer than 32 different histologic types of spermatic cord tumors have been described in the literature.¹⁻²⁰ It is important for the clinician to be aware of the general agreement that about 70 per cent of all solid tumors of the spermatic cord are benign. The fact that 30 per cent prove to be malignant constitutes rational grounds for the complete removal of any cord tumor.^{13, 20}

Including 1954, Gray and Biorn²⁰ found a total of 292 cases reported in the literature and added one of their own; 83 were malignant (28 per cent). Thirty-four simple fibromas have been reported. Morehead⁹ found fibromas second only to lipomas in frequency of occurrence. They are usually small, but occasionally they attain considerable size.

CASE REPORT

A 38-year-old white male complained of a mass in the left scrotum of which he had been aware two

From the Department of Urology, Hertzler Clinic and Hertzler Research Foundation, Halstead, Kansas.



Figure 1. Cross section of the encapsulated tumor. Hyaline degeneration of the center with formation of clefts. In the periphery are coarse bundles of collagenous fibers with very few cells. (x 15)

and a half years. It was symptomless but had enlarged. He enjoyed good health, and physical examination revealed no significant disease. On the left spermatic cord was found a small discrete, firm mass which was estimated to measure 6 mm. across its ovoid surface. It felt smooth and was not attached tightly to surrounding structures. It did not transilluminate light. No lymph nodes were felt or abnormalities seen in roentgen examination.

A preoperative diagnosis of "cord tumor" was made, and the patient was advised to have the tumor removed. This was done the day following examination, using local anesthesia. A firm, glistening tumor was shelled out of the cord without bleeding. The postoperative course was uneventful.

The pathological report (Dr. C. A. Hellwig) was as follows: "The tumor is grossly oval, whitish, and measures 12 x 6 mm. Cross-section shows solid yellowish, translucent tissue surrounded by a thin fibrous whitish capsule. *Microscopically* the tumor of the cord is solid, the center is hyaline and does not show any nuclear stain. It is surrounded with hyaline fibrous tissue with a few slender fibroblasts. No epithelial structures are found in the tumor. *Diagnosis:* Fibroma of spermatic cord with hyaline degeneration (Figures 1 and 2)."

DISCUSSION

Of the almost 300 spermatic cord tumors reported, the majority are mesodermal in origin.¹² The presence of blood vessels, the vas deferens, connective

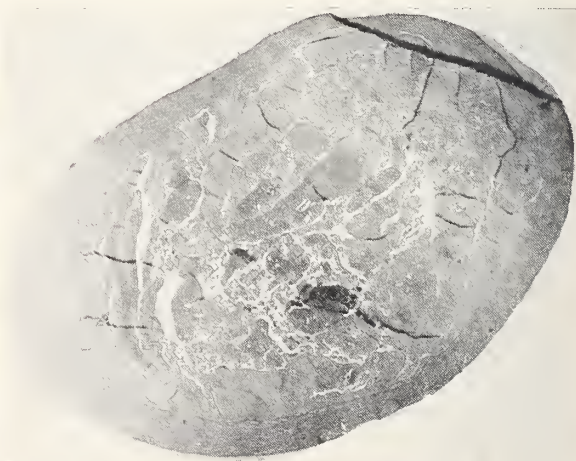


Figure 2. Higher magnification of periphery of the tumor. The fibrocytes do not vary in size and there are no mitotic figures. (x 150)

tissue, nerve fibers, and fat in the spermatic cord may explain the complex constitution of so many of these tumors. As a rule it is not until the surgical specimen is examined under the microscope that an accurate diagnosis is possible.¹⁷

When malignancy does occur it is sarcomatous in 80 per cent of the cases.¹⁴ Strong¹² feels that the malignant condition develops in previously benign tumor. The malignant tumors reported tend to be vicious in their behavior with widespread metastases and a very poor prognosis.

The ease of removal of most spermatic cord tumors strengthens the case for excision of all spermatic cord masses.

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The world has a way of giving what is demanded of it. If you are frightened and look for failure and poverty, you will get them, no matter how hard you may try to succeed. Lack of faith in yourself, in what life will do for you, cuts you off from the good things of the world. Expect victory and you make victory. Nowhere is this truer than in business life where bravery and faith bring both material and spiritual rewards.

—Preston Bradley

PRESIDENT'S PAGE

DEAR DOCTOR:

Babson's says that our Capitol is confused over Ike's plans. This could be important to medicine. I think he will run. We have a more imminent problem, however, in H.R. 7225.

This bill, which so hastily passed the national legislative House, is now being heard in the Senate Finance Committee. Your president plans to appear before this committee to present the reasons Kansas doctors are not in favor of such a bill. You have read the recent brochure sent you concerning this dangerous threat to our nation. Now is the time to let your senator know how you and your friends feel about this legislation. Such Social Security amendments are a threat to good medical care. Also, these proposed changes might result in a drain of funds that could imperil the Social Security trust fund and critically weaken the nation's economy. A costly program of health and accident insurance should not be abruptly combined with the present system of providing pensions for the aged.

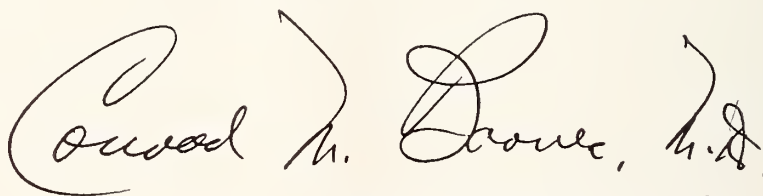
I fear that this H.R. 7225, which would give a disabled person his OASI pension at age 50 and lower the retirement age for women to age 62, is just a "foot-in-the-door" for a compulsory federal care program. By 1975 OASI taxes would probably be double the present amount. This is dangerous legislation!

Do not be complacent about H.R. 7225!

Dr. Cyril V. Black, chairman of our endowment committee and councilor, advises me that we are improving our status with the A.M.E.F. Dr. Black met with the national council of the A.M.E.F. in Chicago on January 22, and he reports that the University of Kansas received \$38,981 in 1955. This amount exceeds the 1954 figure by about \$9,500. Three hundred fifty doctors contributed in 1955, as compared to only 64 in 1954. This evidence of increased physician participation is greatly appreciated by me. Several of our counties had 100 per cent membership contributions. Thank you, doctor! But we still need more contributors and larger contributions. The doctors of Topeka, Kansas City, and Wichita need to get behind this program.

Be alert to do your part in the forthcoming medical assistants training program. See that your medical assistant attends this series of meetings that has been planned by our medical society committee, headed by Dr. Murray Eddy, and the Kansas Medical Assistants' Society.

Sincerely, in the practice of the Art,

A handwritten signature in dark ink, reading "Conrad M. Barnes, M.D.". The signature is fluid and cursive, with the first name "Conrad" being the most prominent.

CONRAD M. BARNES, M.D., *President*

EDITORIAL COMMENT

Our Centenarian Dr. George M. Gray

For the first time in its history the Kansas Medical Society now has an opportunity to salute a past president on the 100th anniversary of his birth. Dr. George M. Gray, Kansas City, will be 100 years old on Sunday, March 4, 1956.

Although not many people can celebrate such an event, that fact alone is not outstanding. What is



George M. Gray, M.D.

important is that Dr. Gray has not merely existed for 100 years; he has *lived* for 100 years, and he enjoys life today. He is alert, interested, progressive. He still looks forward.

To make the occasion a pleasant one for Dr. Gray, a number of friends are planning a dinner party in his honor. It will be held at the Town House Hotel, Kansas City, on Sunday, March 4. Reservations may be made through Dr. C. C. Nesselrode, 1200 Huron Building, Kansas City 10, Kansas.

Through his years of service to the Society, Dr. Gray made countless friends. Those who can be in Kansas City on the anniversary are urged to make reservations immediately so that the guest of honor can enjoy the celebration in the company of those who have a part in the Society and professional activities he loves to recall.

Although he was born in Waukegan, Illinois, March 4, 1856, Dr. Gray became a Kansan at the age of two when his parents moved to Wyandotte

County. He attended public schools and Palmer's Academy in Kansas City and then studied medicine at the College of Physicians and Surgeons, Kansas City, Missouri. He was graduated in 1879 and spent the following year at Bellevue Hospital Medical College, New York.

Dr. Gray began practice in Kansas City in 1880 and has never formally retired. In 1913 he began limiting his practice to surgery. He became a member of the surgical staff of St. Margaret's Hospital in Kansas City when it opened its doors, and he served as chief of its surgical staff for more than 15 years.

His services to organized medicine are legion. He was willing to serve in any capacity, and his talents were frequently employed in various offices, including that of treasurer. In 1912 he held the highest professional office to which a physician in this state may aspire, president of the Kansas Medical Society.

Kansas City, too, benefited from Dr. Gray's guiding hand. He was interested in civic affairs and willingly served as mayor when a vacancy occurred in that office during a period in 1906 and 1907.

Medical Military Aide to the Governor was the title Dr. Gray carried from December 10, 1917, to January 4, 1919, when he was a member of the United States Medical Corps.

A busy life it has been, yes, a productive life, a life of service. Surely in reviewing the events of the past hundred years Dr. Gray can take satisfaction in the knowledge that he gave his best, that his achievements were many, and that his efforts are remembered and appreciated. Of his kind there can never be enough.

The best wishes of the Editorial Board and of the entire membership of the Society go to Dr. Gray at this time. It is the hope of all that March 4, 1956, will be a joyous occasion he will remember with pride as he starts on his second century of life.

Reducing the Budget

Editor's Note. At the time this JOURNAL reaches its readers, the Kansas legislature will have acted on its problem of finance. It will have reduced the state's budget or it will have provided for increased revenue through taxation. The following letter, sent to the editor of each newspaper in the state, was written when the legislature was considering a reduction of 5 per cent in each appropriation, a reduction which would be of great importance to the University of Kansas School of Medicine.

January 19, 1956

Dear Editor:

This open letter concerns a subject the doctors of Kansas believe to be important, and we would be grateful if you were willing to share it with your readers.

There are a few things even more important than

money, and one of these is health. It is strange that health isn't of very great concern until we become sick, and then we spare no effort or expense until we are well again. Often the treatment is much more costly than a little care in advance, which is to say that an ounce of prevention is worth a pound of cure.

That brings up the purpose of this letter. We are hearing rumors that an effort will be made to take a percentage from the budget of every state agency in an economy move. We are as interested in economy as is anyone, but we must remind ourselves that non-selective and careless budget cuts can be not only foolish but dangerous.

We are more familiar with health and therefore illustrate the above statement from examples out of that field. Our state operated schools are expensive, but reflect for a moment the cost of not operating these schools!

Visitors to the campus of Kansas State College at Manhattan will be shocked to see the condition of the facilities for student health services. However important any other item might appear, can the state afford to take less care of its greatest resource—its young people—than for its other property? But it is true at Kansas State College, and a thoughtless reduction in appropriations can only increase this serious problem and postpone its needed solution.

Then consider for a moment an opposite situation. At the University of Kansas School of Medicine you will see a beautiful facility, wonderfully equipped and rendering a most magnificent service to the people of Kansas in caring for the sick, in research, and in educating doctors of medicine.

This budget could be reduced, but where? Where could you take five per cent and retain the service that is now given? Suppose you take out five per cent of the hospital beds, or reduce by five per cent the number of students enrolled. This would be six in each class, six doctors less every year for Kansas communities that could never be made up in any other way.

Or take five per cent from hospital services—from nursing or laboratories, and let the patient take the risk. Or drop a subject from the curriculum and send the doctor out to practice without education in some one field. Or take it out of graduate education and let your personal physician keep up with medical advancements by going to schools in other states if he is to keep up at all.

Any or all of these things can be done to save money. If the appropriation to the University of Kansas School of Medicine is reduced, something like this will happen! And, of course, it will make no difference to you—unless you happen to be the patient who needs the services that have been taken

away. Or unless your town would have received one of those doctors who did not get to study medicine at all. That would have made a difference. Or if your family physician had not attended the circuit course on exactly the subject of your illness because the school couldn't afford to give the course—that would have made a difference.

Yes, we are interested in economy but where the School of Medicine is concerned, please take our word for it because we know that the dollars spent here are ounces compared to the pounds it would cost to repair the loss.

Sincerely,

Conrad M. Barnes, M.D., President
The Kansas Medical Society

Science Fairs

Have you seen the thrill of discovery on the face of a young scientist as he sees an ameba for the first time in his life? Or have you witnessed the breathless anticipation of the youngster digging for fossils in a limestone rock, or the achievement in his mind as he views the rings of Saturn for the first time, or the world that opens for him upon his introduction to trigonometry?

Are his discoveries any less real or less significant because they are new only to him? Even though the seas have been charted by previous explorers, his first journey is as vivid and as exciting as though it had never been made before. Then guide this young boy or girl for only a short time. Teach him to anticipate an expanding horizon, to look forward to never ending discoveries, and soon you will have laid the foundation for a career in science.

The idea of a Science Fair is to do exactly that—to inspire boys and girls to search into the unknown, to give them the pleasures of discovery, to create an interest in a scientific career. This may be in any of the sciences, medicine as truly as physics or astronomy, or mathematics.

Whether it will be in the field of medicine depends upon the direction or guidance that comes from physicians. And up to now that has been small!

There were last year 71 state or regional science fairs in which some 350,000 youngsters competed directly or indirectly. Here were displayed original achievements in research or in construction or in accumulation of data. These children were guided through some 15,000 science clubs in high schools, or by adults who were trying to interest them to become physicists, astronomers, chemists, nurses, or active in any of a hundred other scientific fields.

And some were exploring the field of medical science, but not because organized medicine was alert

to its opportunities for only three of the 71 fairs were sponsored by medical societies, two in Indiana and one in the District of Columbia.

In Kansas there will be three science fairs in 1956. These will be regional events with most of the geographical area of Kansas included. Boys and girls in hundreds of high schools are now working on problems to exhibit. They range from an attempt to analyze the color in butterfly wings to a methodical exploration of pi. Included are principles of genetics applied to the creation of hybrid corn, and the chemical evaluation of the contents of Kansas River water, a fabric tension testing experiment, and an original aircraft design, and many more.

But neither the Kansas Medical Society nor any county medical society in this state has at this time taken a single step to aid these young researchers in their medical experiments. Organized medicine has not tried to stimulate students into studying medicine, and neither have societies utilized this most wonderful opportunity for showing these future scientists what medical research means and what it means to them.

Actually it is not too late. Any individual who believes in young people may approach the science club of the high school in his town and offer to help. Any society may still make this a project for 1956 and have a committee perform this most vital service to youth and at the same time benefit by a beautiful public relations gesture. It is hoped that many may respond in this enterprise—now.

Mid-West Cancer Conference in March

Plans are rapidly being completed for the eighth annual Mid-West Cancer Conference, to be held at the Broadview Hotel, Wichita, March 22 and 23. The Committee on Control of Cancer of the Kansas Medical Society and the Kansas Division, American Cancer Society, are joint sponsors of the event.

In general, the format of previous conferences will be followed. Scientific programs will be presented each morning and afternoon. A banquet on Thursday evening, March 22, will be open to all physicians attending the conference and their wives.

Each speaker who will take part in the program is a specialist widely known throughout the nation. Complete programs will be sent to all members of the Society by direct mail. Biographical sketches of four of the speakers are presented below, and information about others will be published in the March issue of the JOURNAL.

One of the participants, William Ogburn Russell, M.D., is pathologist-in-chief at the M.D. Anderson

Hospital and Tumor Institute, Houston. He is also professor of pathology at the Postgraduate School of Medicine of the University of Texas and associate professor of pathology at Baylor University College of Medicine. He received his degree from Stanford Medical School in 1938. In addition to being a founding fellow of the College of American Pathologists, he is a diplomate of the American Board of Pathology and a member of the American Society of Clinical Pathologists, the American Society of Experimental Pathology, and the International Academy of Pathology.

A second speaker is George D. Snell, Sc.D., who has been research associate for the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, since 1934. His graduate work for the Sc.D. degree, completed at Harvard in 1930, was in the field of mammalian genetics. As a National Research Council fellow at the University of Texas, 1931-1933, he initiated a study continued at the Jackson Laboratory on induction of x-rays and neutron rays of hereditary changes in mice. He is now studying factors determining susceptibility and resistance to tumor homographs.

A 1926 graduate of the University of Kansas School of Medicine who will take part in the program is William J. Engle, M.D., urologist at the Cleveland Clinic Foundation. He has won many professional honors and is now serving as president of the Cleveland Academy of Medicine. He is a diplomate of the American Board of Urology, a fellow of the American College of Surgeons, and a member of the American Urological Association, the American Association of Genito-Urinary Surgeons, the Clinical Society of Genito-Urinary Surgeons, and the International Society of Urology.

Bentley Prescott Colcock, M.D., another guest speaker, has been a member of the staff of the Lahey Clinic, Boston, since 1939. He received his medical degree from the University of Pennsylvania in 1933 and was a fellow in surgery at the Lahey Clinic from 1936 through 1938. He served as a lieutenant colonel in the Army Medical Corps during World War II. Dr. Colcock is a diplomate of the American Board of Surgery, a fellow of the American College of Surgeons, and a member of the New England Surgical Society, the Boston Surgical Society, and Excelsior Surgical Society.

Interest in the Mid-West Cancer Conference has been continuing to grow through the years. Registrants from states other than Kansas always attend, and each year sees an increase in the number of in-state physicians present. Hotel reservations should be made immediately.



Though it may not be wise to mention it openly in a medical publication, we have felt for some time that modern medical writing suffers from an excessively objective and scientific approach. The cold pronouncement of medical fact, case study, or experimentation permits little or nothing of the author's personality to appear in the opus.

After the perusal of a couple of old volumes, we suggest it may be well to return to the earlier custom of "presenting" the material to some individual of intellectual or financial standing by means of a dedicatory preface. We present herewith some examples which may be considered crudely obvious by today's standards but seem to have served well in their time.

One of these is the dedication by Percivall Pott of his *Practical Remarks on the Hydrocele* to one Peter Sainthill, Esq., in 1762. He says, "Some time ago I gave you the trouble of looking over the following sheets in manuscript, with which you said you was much pleased.

"The approbation of so good a judge has emboldned me to print them, and I do not know a more proper person to whom to address them.

"The rank you have long and deservedly borne in the profession and the character you have always maintained in it as an honest man, as a judicious and fair practitioner, give you a just claim to the regard of all its members.

"By this address I mean to express my sense of your merit, and my estimation of your friendship; but lest what I intend as a civility should become offensive, I will not add anything which though strictly true might have the appearance of flattery, nor make a needless recital of those good Qualities which you are so well known to possess.

"I heartily wish you continuance of health, and am, Dear Sir, Your most obedient Servant,
Percivall Pott."

Another medical gentleman who turned a neat phrase of praise was William Harvey whose *De Motu Cordis* was published in 1628

and dedicated to King Charles in this manner:

"To the Most Illustrious and Invincible Monarch Charls King of Great Britain, France, and Ireland, Defender of the Faith. Most Gracious King, The Heart of creatures is the foundation of life, the Prince of all, the Sun of their Microcosm, on which all vegetation does depend, from whence all vigor and strength does flow. Likewise the King is the foundation of his Kingdoms, and the Sun of his Microcosm, the Heart of his Commonwealth, from whence all power and mercy proceeds. I was so bold to offer to your Majesty those things which are written concerning the Heart, so much the rather, because (according to the custom of this age) all things human are according to the pattern of man, and most things in a King according to that of the Heart. . . . You may at least, best of Kings, being plac'd in the top of human things, at the same time contemplate the Principle of Man's Body, and the Image of your Kingly power. I therefore most humbly intreat, most gracious King, accept, according to your accustomed bounty and clemency, these new things concerning the Heart, who are the new light of this age, and indeed the whole Heart of it, a Prince abounding in vertue and grace, to whom we acknowledge our thanks to be due, for any good that England receives, or any pleasure that our life enjoys:

Your Sacred Majesties most devoted Servant,
William Harvey."

He addresses the same volume to another colleague so: "To the Most Excellent and Most Ornate man, D. ARGENT, President of the College of Physicians in London."

Some of our contemporary brethren fulfill the excellent part, but the ornate are harder to find. Nevertheless, it is suggested that aspiring contributors to this journal may well consider opening their future offerings in some such fashion:

"To the Most Wise and Gorgeous Hunke of Edytor, Orville R. Clark."

On second thought, perhaps not.—D.E.G.

Clinicopathological Conference

The Differential Diagnosis of Nephrosis

CASE PRESENTATION

Today we are considering the case of a 45-year-old white female who was admitted to the University of Kansas Medical Center on March 8, 1955, complaining of progressive swelling of her entire body since August 1954. She expired on the evening of April 4, 1955.

The patient was apparently in good health until August 1954 when she had an illness characterized by fever and malaise of six or seven days duration which she called "flu." She felt well for about three weeks afterward, until she noted ankle edema for the first time. Her physician told her that she had albumin in the urine and prescribed a low protein diet and some medication. The swelling progressed, however, and the patient experienced increasing malaise and fatigue.

In November 1954 she was hospitalized and put on a high protein, low salt diet. This was not effective in decreasing the edema. She was given 80 units of corticotropin intramuscularly daily for 10 days, but the anasarca only increased. In January 1955 she was given 100 grams of salt poor albumin intravenously daily for five days, and she had marked diuresis and lost 20 pounds. Her malaise persisted, however, and the edema returned despite salt restriction, diuretics, and ion exchange resins.

The only past illnesses of note were two periods of hospitalization in 1951 and 1953, when the patient was given electroshock treatments for mental depression.

The patient had one brother who died in diabetic coma at age 25 and one sister who was a diabetic.

The only feature of interest in the review of systems was an intermittent diarrhea of two to three loose, liquid stools a day.

When admitted to KUMC the patient appeared to be a well-developed, well-nourished white female who was chronically ill. The outstanding feature of the examination was generalized edema and ascites. The blood pressure was 90/60; the pulse was 88 and regular. There were numerous petechiae on her face and other areas of her body. The eye-grounds were normal. The tongue was red and beefy in ap-

pearance. There were scattered moist rales in the lung bases. The heart sounds were poorly heard, but a definite gallop rhythm was present. The heart size was difficult to ascertain. There were no palpable abdominal masses, but massive anasarca was present. There was edema of the skin of all areas of the body.

Cursory inspection of this clinical history, the physical findings, and the laboratory data quickly suggests a nephrosis, but little more that is specific. The persistent diarrhea, the absence of hypertension, the presence of a gallop rhythm, petechiae, and non-specific electrocardiographic changes were items suggesting some unusual disease entity with widespread visceral damage. No single laboratory procedure, other than a biopsy, had any helpful potential. While the true character of amyloid still eludes us, new and interesting light is being given to the clinical problem with the discovery of a familial characteristic in primary amyloidosis.

A heavy precipitate of albumin was found in the urine. The specific gravity was 1.006, and the specimen was loaded with clumps of pus cells and some hyaline and granular casts. There was no glycosuria. The red count was 5,400,000 with a hemoglobin of 15.0 grams. The white count was 16,000 with 74 per cent polys (57 filamented and 17 non-filamented), 14 lymphocytes, 2 eosinophiles, and 10 monocytes. The platelet count was 220,000. Serology was negative. The serum calcium was 4.0 milliequivalents per liter; phosphorus, 3.7 mEq/L; sodium, 127 mEq/L; potassium, 5.3 mEq/L; CO₂, 17.8 mEq/L; chloride, 98 mEq/L; non-protein nitrogen, 43 milligrams per 100 ml.; creatinine, 2.5 mg. per 100 ml.; sugar, 68 mg. per 100 ml. There was 9.75 per cent excretion of phenolsulfonphthalein in one hour, and the urea clearance was 11 per cent of normal. No Bence-Jones protein was found in the urine. The Addis count was 209,000,000 white cells, 1,760,000 red cells, and no casts in a 24-hour urine specimen. There were 6.9 grams of protein in an 800 ml. 24-hour urine specimen. Urine cultures showed a heavy growth of

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

E. coli. Blood cultures were negative at 10 days. The total serum bilirubin was 0.2 mg. per 100 ml.; serum cholesterol, 984 mg. per 100 ml. with 72 per cent esters; serum albumin, 1.49 grams; serum globulin, 2.31 grams; alkaline phosphatase, 1.9 millimols; cephalin cholesterol flocculation, 1 plus; thymol turbidity, 42 units. I_{131} uptake was 13 per cent. No LE cells were found in the blood. There was 30 per cent retention of Congo red.

On admission the patient was placed on a low sodium diet. She soon experienced nausea, which persisted through the remainder of her hospitalization and severely limited her food and fluid intake. On March 13 she was given one unit of whole blood. From March 17 to March 24 she received a total of 450 grams of salt poor human albumin intravenously in daily divided doses. Her weight did not change, and there was no diuresis. The daily urine output remained at 1000 to 1500 ml. from admission until March 23, after which it never exceeded 500 ml. The serum sodium remained between 120 and 125 mEq/L, and the serum chloride remained below 90 mEq/L during the greater part of her stay. Before March 28 the serum CO_2 was between 15 and 20 mEq/L, and thereafter it was between 8.0 and 15 mEq/L.

On the fourth day after the salt poor albumin was started, the total proteins rose to 4.5 grams per 100 ml. with 3.56 grams of albumin and 0.94 grams of globulin. At this time the cholesterol fell to 310 mg. per 100 ml., and on March 31 it dropped to 190 mg. The blood proteins were essentially unchanged during the remainder of her life, even after salt poor albumin was stopped. At all times the urine sodium levels were above 50 mEq/L and chloride over 30 mEq/L.

On March 25, the third day after her oliguria had become manifest, the patient was given 10 units of corticotropin by slow intravenous drip, and this was repeated daily for 10 days. During this time her condition continued to deteriorate with increasing anasarca, oliguria, malaise, nausea and anorexia, and extension of the petechial rash on various parts of her body.

During the last four days of the patient's life, the daily urine output was between 50 and 200 ml. On March 21 the non-protein nitrogen was 51 mg. per 100 ml., rising to 88 mg. on March 30 and to 142 mg. on the day of death. Attempts were made to promote diuresis by the intravenous administration of hypertonic sodium chloride, but this was without effect. Southey tubes were inserted in her legs and thighs on March 31, and about five liters of fluid were drained in 72 hours. She became progressively

weaker, more dyspneic and somewhat irrational, and died quietly on April 4, 1955.

Dr. Mahlon Delp: One item that wasn't emphasized in the protocol was that this patient had a diarrhea which, I believe, began in November at the time she was first hospitalized and continued until her admission here. It appears that diarrhea must not have been much of a problem during her stay here. Do you recall the diarrhea, Dr. Allen?

Dr. Max Allen (internist): She did have an intermittent diarrhea, but it was no problem during her stay here.

Dr. Delp: Are there any questions for Dr. Cochran?

Mr. Ernie Chaney (senior medical student): Did she have any dysarthria or dysphagia?

Dr. T. E. Cochran (resident in medicine): The tongue was red, beefy, and swollen, and she did have some difficulty in swallowing.

Mr. Chaney: Was a prothrombin time done?

Dr. Cochran: Her admission prothrombin time here was 97 per cent of normal.

Question: Was the patient digitalized?

Dr. Cochran: Not at this hospital.

Mr. Terry Denison (senior medical student): What were the results of the skin tests?

Dr. Delp: I don't think there are any skin tests recorded on this patient.

Mr. Jess Charles (senior medical student): I should like to know whether she showed hypertension at any time.

Dr. Cochran: The blood pressures were low throughout this stay.

Question: Was there pus in the urine?

Dr. Cochran: Yes, there was. Various urinalyses during her first week in the hospital were also reported as being loaded with red cells, and this continued until her terminal phase.

Question: Were electrolytes taken on the day of death?

Dr. Delp: The non-protein nitrogen on the day of death was 142.5 mg. per 100 ml.; creatinine, 6.4 mg.; sodium, 122 mEq/L; potassium, 5.4 mEq; CO_2 , 8.8 mEq; and chloride 88 mEq.

Question: What were the results of serology studies?

Dr. Cochran: They were negative.

Mr. Chaney: Did she have any muscular twitching or convulsions terminally?

Dr. Allen: There were none at any time.

Question: Were petechiae ever noted while taking the blood pressure?

Dr. Cochran: Not to my knowledge.

Dr. T. K. Lin (cardiologist): What was the temperature course in the hospital?

Dr. Delp: There was no elevation above 98.6.

Question: Was a muscle biopsy taken at any time?

Dr. Cochran: There was no biopsy of any kind.

Dr. Delp: Mr. Ashley, will you show us the electrocardiogram.

Mr. John Ashley (senior medical student): This tracing (Figure 1) was made on the second hospital day. The rate is approximately 80, and there is a normal sinus rhythm. Low voltage is apparent throughout, with T wave flattening in all leads. Subsequent tracings show virtually the same thing.

Dr. Delp: Is there anything there that is specific or would help in your differential diagnosis, Mr. Ashley?

Mr. Ashley: Possibly the generalized low voltage.

Dr. Delp: Do you have any comments about these tracings, Dr. Lin?

Dr. Lin: There is a low voltage and there are non-specific T wave changes.

Mr. Kendall Davidson (senior medical student): This first x-ray, a P-A view of the chest (Figure 2), was taken on the day following admission. Within the bony thorax I see no abnormalities or soft tissue changes about the thorax. In the lung fields themselves there is a diffuse haziness bilaterally, more pronounced in the bases. This picture is consistent with diffuse inflammation and possibly fluid in the pleural spaces. There is also a widening of the heart at the base. This may be chamber enlargement, dilatation, or pericardial effusion. The lateral view taken at the same time shows diffuse haziness over the middle and lower lung fields. The cardiophrenic angle is obscured, suggesting either fluid or cardiomegaly.

Dr. Delp: Dr. Tice, do you have any comment on these films?

Dr. Galen Tice (radiologist): The observations noted are entirely correct. There is blunting of the



Figure 2

costophrenic angles and possibly fluid. I think his observations about the heart contour were good. It had a water bottle contour.

DIFFERENTIAL DIAGNOSIS

Dr. Delp: Mr. Chaney, I would like to have your summary of the important items in the protocol and your differential diagnosis.

Mr. Chaney: The case today is that of a 45-year old white woman who was apparently in good health until eight months prior to her death, at which time she suffered an upper respiratory infection with fever and malaise. Three weeks after this there was the onset of pedal edema and albuminuria. Her edema increased, and she was hospitalized and given salt poor albumin, corticotropin, and a low salt diet in an attempt to induce diuresis. Diuresis occurred but her edema reappeared, and she was admitted to this hospital.

Upon admission here she was found to have what was clinically a nephrotic syndrome with hypercholesterolemia, hypoproteinemia, and proteinuria. She had petechiae and a gallop rhythm. She progressed in this despite treatment with salt poor albumin, low salt diet and, terminally, hypertonic salt solution.

The important laboratory findings are in the protocol, so I won't repeat them. Another important thing, as Dr. Delp mentioned, was the diarrhea which was not adequately explained.

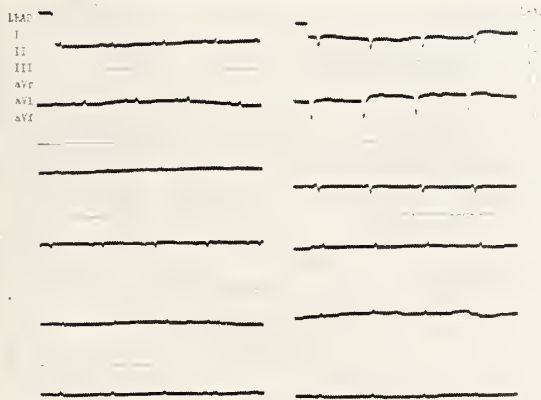


Figure 1

I will base the differential diagnosis today on causes of the nephrotic syndrome. First of all, we should consider toxic nephrosis which may occur with the ingestion of drugs, infections, or the toxemia of pregnancy. Because of a negative history in this case, I shall rule these out. The next thing I would like to consider is that sometimes syphilis can involve the kidney, causing a nephrotic syndrome. This patient had negative serology and no history of lues, so I shall rule out syphilis in this case. Diabetic nephropathy may result in a nephrotic syndrome; however, such patients usually have hypertension, retinal changes, and often a family history of diabetes. She had no clinical or laboratory history of diabetes. Disseminated lupus erythematosus may result in a nephrotic syndrome, but this patient did not have arthralgic pain which is one of the manifestations of the disease, and she had a negative LE cell preparation. Pure lipoid nephrosis can give this picture; however, it usually occurs in children, with eventual recovery.

Now I come to three diseases which we have to consider a little more seriously. These are the amyloid diseases of the kidney which are usually classified in three groups: primary amyloid disease, secondary amyloidosis, and tertiary amyloid disease as seen in multiple myeloma.

This patient was a female; she had no bone pain, no x-ray evidence of multiple myeloma, and no Bence-Jones protein. So I think I can rule out multiple myeloma.

Secondary amyloidosis usually comes from a chronic debilitating disease. It has been described in tuberculosis, bronchiectasis and ulcerative colitis. She had none of these. She had a negative Congo red test. It is considered to be positive if 80 to 90 per cent of the dye is retained, but only 50 per cent of patients with secondary amyloidosis have a positive Congo red test. Amyloid usually involves organs such as kidney, liver, and spleen below the diaphragm. Even though she may have had involvement of her liver and spleen, they could not be felt. On this basis I rule out secondary amyloid disease.

Primary amyloidosis is a rare disease. It usually involves the small vessels of the skin, tongue, and myocardium. In some 20 per cent of the cases it involves the kidney. This patient had a number of things which make me think of primary amyloid disease. She had hypotension, hypercholesterolemia, diarrhea, petechiae, and the nephrotic syndrome. The fact that she had a negative Congo red test does not disturb me, because primary amyloid picks up the dye less than does the secondary.

The next lesion to consider is bilateral renal vein thrombosis. This occurs rarely. There were five cases

in adults reported in the literature up to December 1954. It occurs more commonly in children, typically in a child who has diarrhea and who is dehydrated, with an onset of acute flank pain and hematuria. They usually have a lateral palpable abdominal mass, and the clinical course is usually hopeless. Because of the rarity of the disease and because of the clinical picture, I rule out bilateral renal vein thrombosis.

Another condition to consider is subacute or chronic glomerulonephritis. These two entities are difficult to differentiate clinically and pathologically. They can result in the nephrotic syndrome. The usual course is longer than in this case. Terminally these patients may have hypertension. I lean toward that diagnosis, but, in summary, I would say that I cannot entirely rule out renal vein thrombosis and primary amyloidosis.

As for the patient's hospital course, approximately four days prior to her death she went into an oliguric state. This is difficult to evaluate. I thought that probably she was in a low salt syndrome when she was admitted to this hospital, and that she continued in this condition. The plasma volume of patients with the nephrotic syndrome has been shown to be some 20 to 30 per cent lower than in the normal individual. These two factors together may have resulted in a decreased blood flow to the kidneys which were already damaged, and some type of tubular lesion akin to lower nephron nephrosis occurred, and the patient went on into uremia.

We also have to consider the possibility that her terminal event was one of hyperpotassemia, and that she received a hypertonic saline solution on the day of death and may have had a cardiovascular collapse due to overloading of the cardiovascular system.

Dr. Delp: Thank you, Mr. Chaney. I choose to think that you included the consideration of bilateral renal vein thrombosis out of respect to me. I have to admit that that was my diagnosis of this patient, and I publicized it too widely.

CLINICAL DISCUSSION

Dr. Delp: I really wish to hold the major discussion after the pathology is presented, but I can't refrain from asking Dr. Kaul and Dr. Berry what their differential diagnosis might have included.

Dr. Phil Kaul (internist): I might begin by saying that the student gave an excellent presentation. One must consider the possibility of constrictive pericarditis in any nephrotic-like syndrome, or anasarca. The lack of hypertension at any time during the patient's course would be against the nephrotic syndrome as a result of glomerulonephritis. It makes one think more in terms of nephrosis, possibly due to amyloid disease.

Dr. Max Berry (internist): First of all I want to say that was an excellent presentation, and I am sorry to say that I don't have my thoughts as well organized as the student did.

This woman probably had a nephrotic syndrome, whatever the nephrotic syndrome is, and, in addition to that, one has to consider what complication might have occurred to cause her death. I don't know, and am a little bit reluctant to ask, through innate modesty, whether this woman had any cortisone. Aggravation of the glomerular lesion would make me hesitant to give any cortisone. I would think that corticotropin would do the same thing. I don't know that I would have handled the patient any differently. The possibility of adrenal cortical atrophy must be considered because this woman had certain things to suggest it, such as low blood pressure and diarrhea, and the fact that she deteriorated progressively in spite of what I think was good medical treatment. If she had enough cortisone to suppress the function of her adrenal cortex, it is a possibility that she died in adrenal cortical insufficiency.

Dr. Delp: Mr. Buie, what was your diagnosis?

Mr. Dan Buie (senior medical student): Primary amyloidosis.

Dr. Delp: It was said in the protocol that this patient had a febrile illness as the first evidence of sickness. She had little thereafter. How do you explain that?

Mr. Buie: I do not think that was part of this illness. If I were trying to make it part of the illness, I would think of acute glomerulonephritis, but I don't think we have evidence for that diagnosis.

Dr. Delp: How do you do a Congo red test, Mr. Cox?

Mr. Wallace Cox (senior medical student): A milliliter of 1 per cent Congo red solution is injected intravenously, and the blood concentration is determined at intervals, including a one-hour determination. If less than 40 per cent of the dye is absorbed, the test is negative. If over 40 per cent, and especially if over 90 per cent of the dye is absorbed, the test is considered indicative of amyloid disease.

Dr. Delp: Mr. Denison, is this a normal Addis count?

Mr. Denison: No. There is elevation in the Addis count, particularly in the white and red cell count. The normal white cell is six-tenths of a million, and the patient had 209,000,000. The normal red count is approximately one-tenth million.

Dr. Delp: Is the Addis count a procedure of any merit?

Mr. Denison: I question whether it is of any real merit in this case. The increase in white count is evidence of infection in the kidneys, such as pyelone-

phritis, but it is a common observation in patients with the nephrotic syndrome. The elevation of the red count indicates that she was losing red blood cells. I don't know why, unless it was due to breakdown of the glomerular integrity. This is possible in a severely damaged kidney like she had. I question the complete lack of casts in the Addis count, because a normal individual has a range of a few thousand casts. It is probably a mistake, particularly considering the amount of protein that is present.

Dr. Delp: Mr. Davidson, this patient had a thymol turbidity of 42 units reported on the liver function profile. Do you have any comments?

Mr. Davidson: In cases in which there is high cholesterol at the time of determination, the thymol turbidity may be unreliable.

Dr. Delp: Mr. Ashley, this patient's most outstanding evidence of disease must have been her edema. What do you think was the most significant physical finding that she had?

Mr. Ashley: I think that the presence of petechiae is outstanding.

Dr. Delp: You think this should have been the clue to the diagnosis, Mr. Chaney?

Mr. Chaney: I think the cardiovascular symptoms and the gallop rhythm.

Dr. Delp: Gallop rhythm! This certainly could be a most significant finding.

PATHOLOGY REPORT

Dr. Harlan Firminger (pathologist): This patient was about 65 inches in height and weighed about 170 pounds. She appeared reasonably well nourished and not debilitated. The abdomen was distended, and the skin everywhere was extremely pale except for the numerous petechiae. These petechiae were concentrated particularly in areas of motion, such as the eyelids, the angles of the buccal mucosa, the anterior axillary folds, and the inguinal folds.

About 4.5 liters of serous fluid was found in the peritoneal cavity. The thoracic cavity contained about 1200 ml. and the pericardial cavity about 250 ml. of similar serous fluid. All the organs were somewhat enlarged, due partly to edema. In many organs there were small, pinkish deposits which stained a deep mahogany brown with iodine. The picture was that of primary amyloidosis, and I shall present the organs in the order that they are most frequently involved by this disease.

The heart was enlarged and weighed 580 grams. The myocardium of both ventricles was thickened, and the chambers were somewhat dilated. There were tiny, dark, grayish-pink oval areas about 1 to 2 mm. in diameter throughout the myocardium. Plaques of similar material were present on the endocardium,

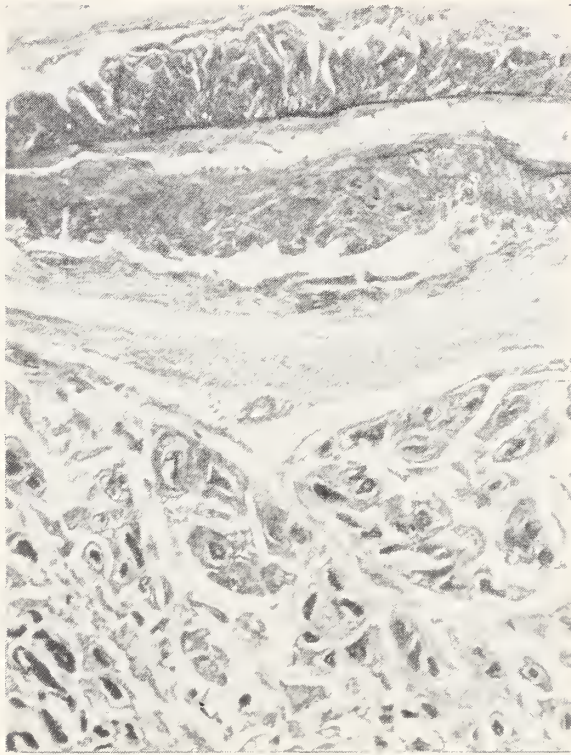


Figure 3. Photomicrograph of the myocardium demonstrating rings of amyloid around individual myocardial fibers. The wall of an adjacent coronary artery also shows extensive deposition of amyloid in the walls (crystal violet stain).

and vesicular appearing little pink nodules were present on every valve in the heart. All of these lesions gave a positive reaction for amyloid using iodine.

Microscopic sections from such an area in the endocardium revealed a large plaque of relatively homogeneous eosinophilic material. In sections of the myocardium stained with hematoxylin and eosin, one sees an immense amount of eosinophilic deposit interstitially, surrounding many of the myocardial fibers and around the blood vessels. This ringing of the myocardial fibers is characteristic of amyloidosis. The crystal violet stain, which stains amyloid a bright red in contrast to nonamyloid tissues which are purple or blue, demonstrates a massive replacement in many areas of the myocardium by amyloid. A section of myocardium shows rings of amyloid about myocardial fibers and a large coronary vessel involved with amyloid (Figure 3).

The gastrointestinal tract is the next most frequently involved by primary amyloidosis and particularly the tongue. Unfortunately we do not have sections of the patient's tongue. We could see that the stomach was involved grossly, but it is not easily seen in the fixed specimen. In addition, there are

numerous hemorrhages in the gastric mucosa. The duodenum shows tremendous deposits of eosinophilic material within the mucosa. The vessels are also involved. This is rather characteristic. The appendix shows tremendous amounts of the same material in the muscle and the subserosa.

The lung shows amyloid in the alveolar walls and around small blood vessels.

The kidneys are quite large and together weigh about 550 grams (Figure 4). They are pale with prominent red medullae, and the cortex is much thickened. The consistency is waxy. The architecture is obscure. There are petechiae in the pelvis of the kidneys. Arteriosclerosis is not particularly striking either in the kidneys or elsewhere. A histologic section with hematoxylin and eosin stain shows the amyloid material around the capillaries and in the wall of the entering arteriole very brilliantly (Figure 5).

The adrenal gland shows a mass of amyloid material involving the entering vessels. Another section shows the amyloid even better extracellularly, more like that seen in secondary amyloidosis.

The liver has tremendous amyloid deposits around the blood vessels of the portal veins, but there is a lack of amyloid deposition along the sinusoids, such as one sees in secondary amyloidosis.

Small vessels of the pancreas are involved, and in some instances their lumens are narrowed. Generally the vessels are not particularly narrowed.

In the brain there are deposits which look like amyloid around the cerebral vessels, but we have not

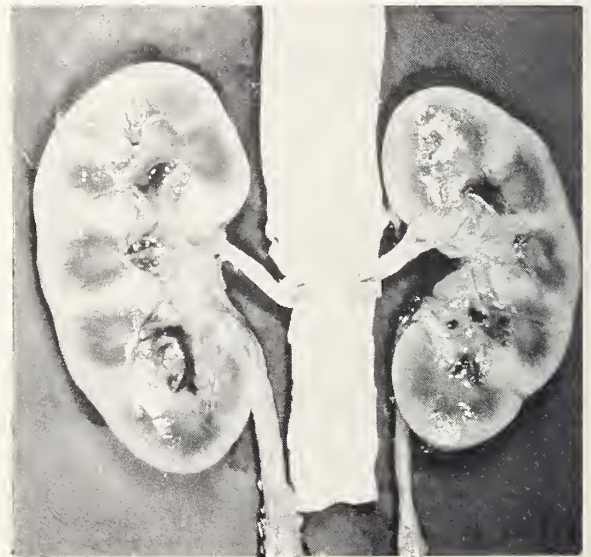


Figure 4. Gross photograph of the kidneys which are enlarged, pale, and firm with a waxy cut surface and obscure cortical architecture.

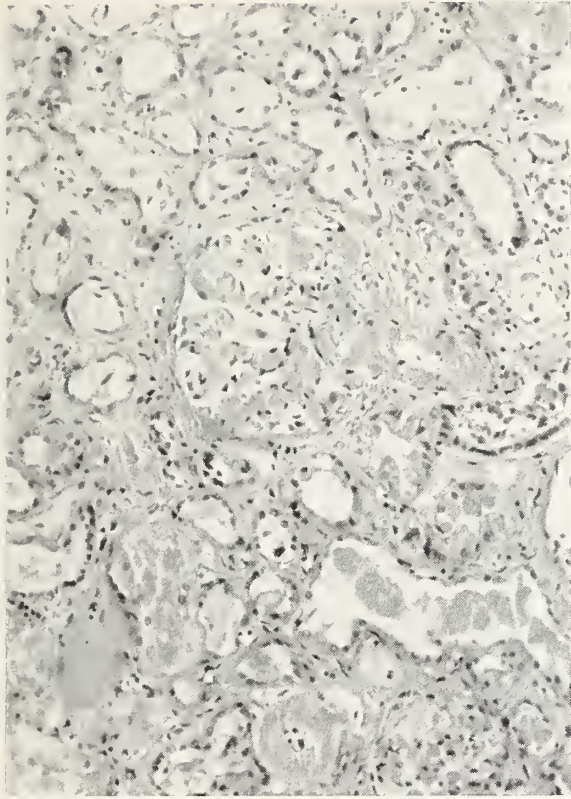


Figure 5. Photomicrograph of kidney showing deposition of amyloid in the glomerular tuft and entering arteriole. All the renal tubules are dilated and contain precipitated proteinaceous material. There is degeneration of the renal tubular epithelium (hematoxylin and eosin stain).

done a differential stain. The deposits do not involve the media to any extent but occur in the outer portion of the vessels.

Finally, the uterus is described as frequently being involved. It is a tremendous organ, which is soft, red, and boggy. Histologically it has amyloid deposits in the subserosal vessels. The crystal violet stain shows tremendous replacement of uterine muscle by bright red staining amyloid material.

Now, this would appear to add up nicely to a fine case of primary amyloidosis, with all the essential findings. The types have already been described by the student, and I will not reiterate them. I would like to mention a little about the clinical pathological correlation.

This severe, apparent pallor of the patient was due to amyloidosis of the skin. The cutaneous vessels and the dermis were involved, and the skin was diffusely edematous. Hypotension is characteristic of this disease in contrast to acute glomerulonephritis with which this might be confused. A normal red blood

cell count is uncommon in chronic nephritis. The petechiae occur characteristically in the areas subjected to motion or trauma, being due to amyloid involvement of the walls of the vessels in those areas in the skin. The rales in the lungs could be caused by edema or heart failure. The electrocardiographic changes are apparent, and these patients may have dysrhythmias caused by amyloid deposits. The urinalysis is characteristic, albumin and cells go through the involved glomeruli. There are tremendous numbers of casts in this case. I agree with the student that there was an error in the Addis count. The loss of sodium and chloride would apparently be renal. I think she died in uremia.

I did not mention the spleen, by the way; it was firm, and, in addition to extensive amyloid deposition, there was a healed infarct in it which is frequently found in this disease.

I would like to conclude by mentioning the theories which are suggested for primary amyloidosis; it is obvious that we do not know the cause. It may be a generalized disturbance in protein metabolism. It may be the result of an antigen-antibody reaction. Some have suggested that it belongs among the collagen diseases. My own interpretation at the moment is that it is an unexplained phenomenon which usually involves the smaller blood vessels and sometimes the larger, with perhaps a loss of albumin into and through the walls of peripheral vessels, much the same as occurs in the glomeruli. This causes edema of the organs, including subcutaneous tissues, and produces a reversal of the albumin/globulin ratio which is characteristic as in this case. Unfortunately, careful chemical analysis of amyloid still needs to be done so that we may have more definite information as to just what it is.

Mr. Chaney: What about the kidney tubules?

Dr. Firminger: The tubules were degenerated on the basis of casts within them and pressure atrophy of the tubules, and also perhaps some ischemia due to impairment of the flow of blood supplying them. There was some fat within them, but this could not be classified as a lipoid nephrosis. It was primarily a glomerular lesion with the tubular lesion being secondary.

One might ask why hypertension does not occur in these cases. Certainly the renal component is present. One would think that there would be decreased blood flow through these glomeruli. My suggestion is that the involvement of the heart may play some part in the lack of hypertension, but more important is the fact that the vessels throughout the body have their muscularis replaced with amyloid and cannot produce the increased peripheral resistance to give hypertension.

ACH

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Dr. Delp: What were the bone marrow findings?

Dr. Firminger: The bone marrow, if anything, was a little on the hyperplastic side. The femoral marrow was deep red, otherwise not peculiar.

Dr. Sloan Wilson (hematologist): No plasma cells?

Dr. Firminger: No plasma cells.

Dr. Albert Jackson (internist): Would a liver biopsy have given the diagnosis?

Dr. Firminger: A liver biopsy would not have helped unless you were lucky enough to get one of the big vessels. The usual method of diagnosing primary amyloidosis is by biopsy of the tongue.

Dr. Delp: Dr. Christianson has had considerable interest in this entity and has studied at least one case carefully. He has had contact with two other patients within the past year. I would like to ask for his comments.

Dr. John F. Christianson (internist): Certainly amyloid disease is a unique entity, particularly because of the abnormalities in the protein metabolism. It may be related to some of the lipid abnormalities, such as the reticulum cell with deposition of abnormal protein-chondroitin-sulfuric acid material, which some workers think is identical with amyloid.

For some time we have thought that we could divide amyloid into at least three and possibly four groups: the so-called primary, or paramyloid; the secondary, or true amyloid, which follows granulomas or suppuration, tuberculosis, osteomyelitis, etc.; the amyloid which is found in close association with multiple myeloma; and the tumor forming or plasmacytoma. The true, or secondary type of amyloid, is generally deposited in the parenchymatous glands such as the liver, kidneys, spleen, and adrenals, whereas the primary type is generally found in the tissues of mesenchymal origin as Dr. Firminger outlined.

This case falls into the class of primary amyloidosis. It is my belief, however, that the thinking on amyloid disease is in for a revision, particularly in view of some work that is being done at the University of Michigan.

Ostertag,⁴ in 1950, was the first to refer to a familial tendency in amyloidosis. Andrade,¹ from Portugal, published in 1952 the first convincing evidence of the familial nature of the disease. He studied 12 families, and, in two of them, was able to see patients of two generations.

In June 1953, Kantarjian and De Jong³ of the University of Michigan published reports of three cases, a man and his two daughters, who died of proved primary amyloid disease. The three had identical courses with diarrhea, visual difficulties, dysphagia, some nausea and vomiting, and gradual and

progressive parenchymal failure of the heart or kidneys. They first ran onto the two sisters, and in a retrospective history were able to obtain from the Wood Wisconsin Veterans Administration Hospital the autopsy material of the father, who had died in 1938 of proved amyloid disease.

At present, at the University of Michigan, the dermatology and neurology sections of medicine are studying a group of Mennonites of Swiss extraction who live in Indiana. They have worked up reports on approximately 300 people in the colony. Their interest was aroused when a patient presented herself to the university and was found to have floating opacities in the eye. The ophthalmologist had seen some patients with amyloid disease who had floating opacities, keratitis, and so on. A gingival biopsy was done, and the diagnosis of amyloid disease was made. The patient said that her sister also had some difficulty with vision; when she was studied she was also proved to have amyloid disease.

Electrophoretic patterns were taken on these two patients and the investigators noted a "blip" between the alpha-two and the beta globulin. They considered this to be alpha-three globulin. The pattern was consistent, and through the help of the Mennonite church, they went into Indiana and drew electrophoretic patterns on approximately 300 people. This included adolescents and infants. They found this same electrophoretic pattern in approximately 80 per cent of some family lines, seemingly on a simple Mendelian dominant type of progression. They are postulating that amyloidosis is an inherent disease of mesenchymal tissue, and that eventually the people who have this inherent defect in their tissue will develop primary amyloidosis. They have taken a number of patients from this colony to the University of Michigan and have performed biopsies, and have proved primary amyloidosis, asymptomatic at the time.

Dr. Delp: In July of this year we had admitted here another patient who presented herself with evidence primarily of disease of the cardiovascular system (congestive failure and a gallop rhythm) who had no logical explanation for the etiology of this congestive failure. She had diarrhea, and again I will have to admit that she had had electroshock therapy two years before.

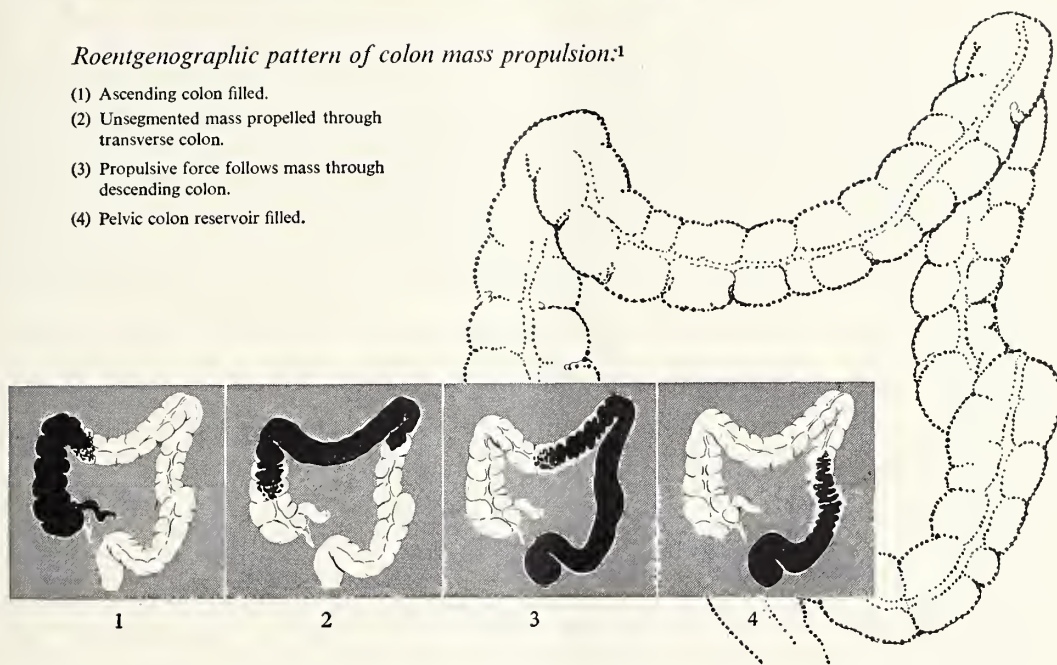
Perhaps because this fitted into the same pattern that we have all stumbled on before, we did make the diagnosis. This patient had involvement of all of the salivary glands, and a biopsy of those glands revealed the diagnosis quickly.

So this is not exactly a rarity, and because of the rather interesting phenomenon that Dr. Christianson has just discussed, I was determined that we would

SMOOTHAGE ACTION IN CONSTIPATION

Roentgenographic pattern of colon mass propulsion:¹

- (1) Ascending colon filled.
- (2) Unsegmented mass propelled through transverse colon.
- (3) Propulsive force follows mass through descending colon.
- (4) Pelvic colon reservoir filled.



Reestablishing Bowel Reflexes with Metamucil®

Nervous fatigue, tension, injudicious diet, failure to establish regularity, too little exercise, excessive use of cathartics—all factors which contribute to constipation.²

Sufficient bulk and sufficient fluid form the basic rationale of treatment of constipation. Metamucil (the mucilloid of *Plantago ovata*) produces a bland, smooth bulk when mixed with the intestinal contents. This bulk, through its mass alone, stimulates the peristaltic reflex and thus initiates the desire to evacuate, even in patients in whom postoperative hesitancy exists.

Correction of constipation logically, therefore, lies in the suitable adjustment of such factors as nervous fatigue and tension, improper intake of fluid, improper dietary habits, failure to respond to the call to stool, lack of physical exercise and abuse of the intestinal tract through excessive use of laxatives.²

The characteristics of Metamucil permit the correction of most of these factors: it provides bulk; it demands adequate intake of fluids (one glass with Metamucil powder, one glass after each dose); it increases the physiologic demand to evacuate; and

it does not establish a laxative "habit." Metamucil, in addition, is inert, and also nonirritating and non-allergenic.

The average adult dose is one rounded teaspoonful of Metamucil powder in a glass of cool water, milk or fruit juice, followed by an additional glass of fluid if indicated.

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1. Best, C. H., and Taylor, N. B.: *The Physiological Basis of Medical Practice: A Text in Applied Physiology*, ed. 5, Baltimore, The Williams & Wilkins Company, 1950, pp. 579-583.

2. Bargen, J. A.: A Method of Improving Function of the Bowel, *Gastroenterology* 13:275 (Oct.) 1949.

SEARLE

present this case. Such patients usually present themselves with signs of renal disease, such as nephritis or the nephrotic syndrome, but manifesting either an enlarged liver or cardiovascular findings for which one can find no decent reason. Now I take into consideration the fact that congestive failure does occur in some patients with acute glomerulonephritis, and the subacute forms of the nephrotic syndrome, but this is not very common. So this, as Mr. Chaney indicated, should be a clue. I think the gastrointestinal symptoms which in some respects appear to be similar to the sprue-like syndrome we see in other infiltrative lesions of the small intestines are probably also equally important if we are going to recognize this entity.

PATHOLOGICAL ANATOMICAL DIAGNOSIS

Primary systemic amyloidosis involving arteries and arterioles throughout the body with interstitial amyloid deposits in the heart, spleen, liver, stomach and duodenum, appendix, adrenals, kidneys, ureters, uterus, and ovaries (history of progressive edema beginning six months before death with anasarca and multiple petechiae for three months before death).

Healed infarct of the spleen.

Anasarca with 4500 ml. in the peritoneal cavity, 1200 ml. in each pleural cavity, and 250 ml. in the pericardium.

Multiple petechial hemorrhages in skin, buccal mucosa, left conjunctiva, stomach, ileum, colon, renal pelvic mucosa, and urinary bladder.

Hyperplasia of right femoral bone marrow, slight.

Acute passive congestion of lungs and liver.

Acute hemorrhagic colitis involving the ascending and transverse colon (history of uremia for 12 days before death).

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1. Andrade, C.: A peculiar form of peripheral neuropathy: familial atypical generalized amyloidosis with special involvement of the peripheral nerves, *Brain* 75:408, 1952.
2. Eisen, H. N.: Primary systemic amyloidosis, *Am. J. Med.* 1:144-160, 1946.
3. Kantarjian, A., and De Jong, R.: Familial primary amyloidosis with nervous system involvement, *Neurology* 3:399, 1953.
4. Ostertag, B.: Familiäre Amyloid-Erkrankung, *Ztschv. f. Menschl. Vererb. u. Konstitutionslehre*, 30:105, 1950.

A booklet on rheumatic fever in children, prepared to supply information to parents, was published recently by the Children's Bureau, U. S. Department of Health, Education, and Welfare. The bulletin, entitled "The Child with Rheumatic Fever," may be secured from the Government Printing Office, Washington 25, D. C.

DEATH NOTICES

JOHN T. KENNEDY, M.D.

Dr. J. T. Kennedy, 77, Blue Mound physician for 51 years, died at Fort Scott on December 16 after a sudden illness. He was graduated from University Medical College, Kansas City, in 1904 and immediately began practice in Blue Mound. He was an active member of the Linn County Medical Society, had served several terms as coroner, and was a member of the Blue Mound city council for 45 years.

EDWIN McCORMICK IRELAND, M.D.

Dr. E. M. Ireland, 74, a retired physician at Pratt, died at a Topeka hospital on January 10. Dr. Ireland was graduated from the University Medical College, Kansas City, in 1910 and received his Kansas license the same year. He practiced in Coldwater and Protection before entering the service during World War I, then opened an office in Coats, where he continued to practice until his retirement.

EDWARD CHESTER PETTERSON, M.D.

Dr. E. C. Petterson, 61, a member of the Central Kansas Medical Society, died at the Plainville Hospital, of which he was chief of staff, on January 14. He had practiced in Plainville since 1936. Dr. Petterson was graduated from the University of Kansas School of Medicine in 1920 and started practice at Palco. He had served as health officer and coroner of Rooks County.

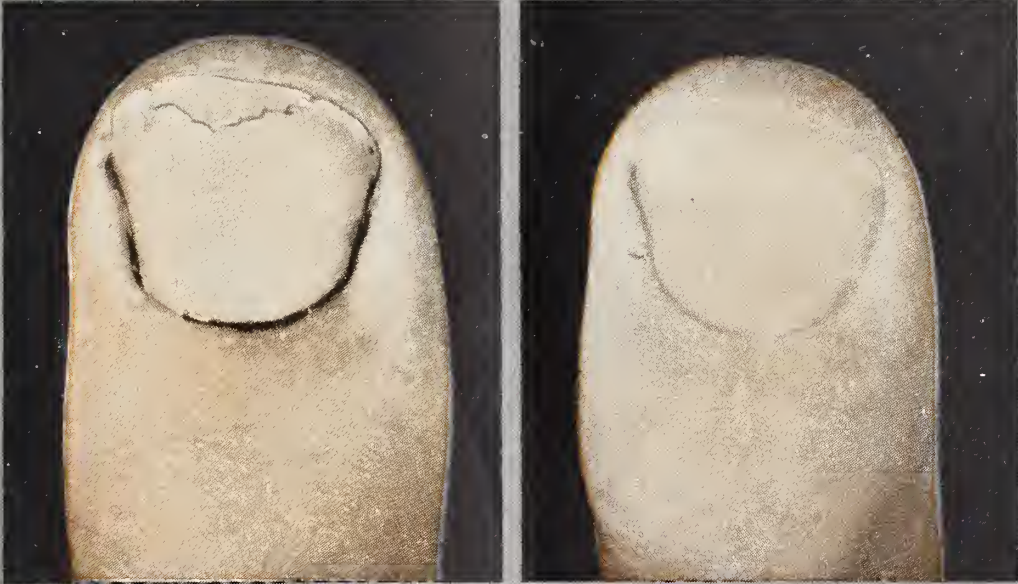
WILLIAM LEWIS BORST, M.D.

Dr. W. L. Borst, 83, Topeka physician for 35 years, died on January 21. He was a member of the Shawnee County Medical Society. Dr. Borst was graduated from Kansas Medical College, Topeka, in 1900 and practiced for periods of time in Republic, Meriden, McLough, and Belpre before moving to Topeka.

United States hospitals cared for 20,345,431 patients in 1954, more than in any previous year, the American Hospital Association announces. This was an increase of 161,604 over 1953's total.

KNOX

Protein Previews



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In a recent study¹ that confirmed previous work² Knox Gelatine was used to treat 36 women with fragile, brittle, laminating fingernails. The response was most gratifying. Except for three patients who discontinued the therapy, three diabetics, and two women who had congenital deformities, the splitting ceased and all other patients were able to manicure their nails to a full point by the time the study ended.

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three months. Improvement, however, was noted after the first month. If you would like more complete details of this work, just use the coupon.

1. Rosenberg, S. and Oster, K. A., "Gelatine in the Treatment of Brittle Nails," *Conn. State Med. J.* 19:171-179, March 1955.
2. Tyson, T. L., *J. Invest. Dermat.* 14:323, May 1950.

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PHYSICIANS' ACTIVITIES

Dr. Howard E. Snyder, Winfield, will speak on "Civilian Aspects of Mass Casualties" at a sectional meeting of the American College of Surgeons to be held in Colorado Springs, March 5-7.

Dr. Dale C. Smith has announced the opening of an office in Mission. A graduate of the University of Kansas School of Medicine in 1945, Dr. Smith served two years in the Army in World War II, practiced in Fredonia for three years, and recently completed a three-year residency in ophthalmology at the Mayo Clinic.

Dr. A. M. Tocker, Wichita, has been elected an associate member of the American Association for Thoracic Surgeons.

Dr. Walter J. Pettijohn, Russell, was recently named by Governor Fred Hall as a member of the Kansas Commission on Alcoholism, succeeding **Dr. Karl Voldeng**, Wellington, who had asked that he not be considered for reappointment.

Dr. Andrew M. Shelton, formerly of Mooreland, Oklahoma, has opened an office in Jetmore. Dr. Shelton, a graduate of Johns Hopkins Medical School in 1951, had a two-year residency in surgery at University Hospital, Little Rock, and practiced in Rockdale, Texas, before going to Oklahoma.

Dr. James G. Gaume, an Ellinwood physician, went to San Antonio last month to serve as research associate physiologist in the department of space medicine, a civilian adjunct to the Air Force. He had served as a flight surgeon from 1942 to 1946 and was introduced to the field of space medicine at that time.

Dr. Jerome S. Menaker, Wichita, presented a paper, "Carcinoma of the Uterus," at a recent meeting of the Southern Medical Association in Houston.

The secretary of the Kansas State Board of Health, **Dr. Thomas R. Hood**, was named to a three-year term on the executive board of the American Public Health Association at the organization's meeting in Kansas City recently. He is also chairman of the Maternal and Child Health Committee, State and Territorial Health Officers Association.

"Man of the Year" was the title conferred on **Dr.**

Michael W. Scimeca, Caney, last month. The title was conferred by the student body of Caney High School.

Dr. Frank A. Dlabal, Wilson, is now maintaining an office in Sylvan Grove also and will see patients there two days a week.

After six months of practice in Russell, **Dr. John W. Weigel** reported last month for duty with the Army at Brooke Army Medical Center, Fort Sam Houston, San Antonio. He plans to return to Russell on completion of the Army duty.

The work a community can do in helping solve heart and cancer problems was outlined by **Dr. Had-don Peck**, St. Francis, at a meeting of the Thomas County Health Council in Colby on January 10.

Dr. Ralph R. Reed, who formerly practiced in Beloit in association with **Dr. H. B. Vallette**, has opened an office in Lawrence.

Dr. Robert Hughes, Russell, announces that **Dr. Wendale E. McAllaster**, formerly of Kansas City, Missouri, is now associated with him in practice. Dr. McAllaster was graduated from the University of Kansas School of Medicine in 1954 and served his internship at St. Mary's Hospital in Kansas City.

Dr. Arnold Greenhouse, who recently completed a three-year residency in internal medicine at the University of Kansas Medical Center, is now practicing in Garden City in association with **Dr. H. M. Wiley**.

Dr. Harry R. Custer, Colby, recently completed the examination of the American Board of Surgery and is now a diplomate of that board.

A dinner party honoring **Dr. James A. Simpson**, Salina, was given at the Salina Country Club on January 19 by the Saline County Medical Society. Dr. Simpson recently completed 50 years of practice.

Dr. Alex Scott, formerly of Belleville, recently began practice in Junction City in association with **Dr. C. V. Minnick**.

Dr. John I. Waller, Halstead, recently became a fellow of the American College of Surgeons.

Dr. R. Dale Dickson, Topeka, has been invited

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to present a paper on histamines at the Southwest Allergy Forum at Beaumont, Texas, early in April.

Dr. Conrad M. Barnes, Seneca, is serving as a member of the executive committee of the 1956 Crusade for Freedom.

Dr. E. Ernest Johnson, Norton, has become a member of the surgical staff at the state sanatorium at Norton.

Announcement is made of the marriage of Mrs. Katherine Park Gilliland, Topeka, and **Dr. Lucien R. Pyle**, Topeka, a past president of the Kansas Medical Society. The ceremony was performed at the First Presbyterian Church in Topeka on February 3.

A certificate of merit from the Sedgwick County Cancer Society was presented last month to **Dr. J. P. Berger**, Wichita, for outstanding volunteer service in the fight against cancer.

Dr. Ralph R. Reed, who has practiced in Beloit for the last year and a half, has moved to Lawrence and is practicing there in association with **Dr. L. K. Zimmer**.

Obstetrical Society Meeting

A meeting of the Kansas State Obstetrical Society will be held at the office of the Sedgwick County Medical Society, Wichita, on Thursday, March 1. The meeting will begin in mid-afternoon and will be concluded with a dinner. Dr. E. Stewart Taylor, professor of obstetrics and gynecology, University of Colorado Medical School, will be guest speaker.

Another meeting of the group is scheduled for Tuesday, May 1, at Topeka, a dinner session with an evening program. Guest speaker on that occasion will be Dr. William C. Keettel, of the University of Iowa Medical School.

All members of the Kansas Medical Society are eligible to become members of the Kansas State Obstetrical Society. Checks for dues, \$5.00, may be sent to Dr. Edward Crowley, secretary-treasurer, 435 North Hillside, Wichita.

Two-thirds of all maternal deaths can still be considered preventable, according to the Maternal Mortality Committee of the American Academy of Obstetrics and Gynecology on the completion of a study of the matter. It was the opinion of the committee that 1,723 of the 2,610 maternal deaths in the United States in 1952 would not have occurred if ideal care had been available for all expectant mothers.

Nominations for 1956-1957

A meeting of the Nominating Committee of the Kansas Medical Society was held in Salina in December, and the following names were proposed for the various offices to be filled by vote of the House of Delegates at the annual session in May:

FOR PRESIDENT-ELECT

Dr. Barrett A. Nelson, Manhattan

FOR FIRST VICE-PRESIDENT

Dr. Cyril V. Black, Pratt
Dr. Thomas P. Butcher, Emporia
Dr. Grant R. Hastings, Garden City
Dr. Dwight Lawson, Topeka
Dr. Glenn R. Peters, Kansas City
Dr. Robert Sohlberg, Jr., McPherson

FOR SECOND VICE-PRESIDENT

Dr. Cyril V. Black, Pratt
Dr. Thomas P. Butcher, Emporia
Dr. Grant R. Hastings, Garden City
Dr. Dwight Lawson, Topeka
Dr. Glenn R. Peters, Kansas City
Dr. Robert Sohlberg, Jr., McPherson

FOR CONSTITUTIONAL SECRETARY

Dr. George E. Burket, Jr., Kingman

FOR TREASURER

Dr. John L. Lattimore, Topeka

FOR A.M.A. DELEGATE, 1957-1958

Dr. Lucien R. Pyle, Topeka

FOR A.M.A. ALTERNATE, 1957-1958

Dr. Norton L. Francis, Wichita
Dr. H. P. Jones, Lawrence
Dr. Edward J. Ryan, Emporia

The list is presented now in accordance with provisions of the Constitution and By-Laws. Additional nominations, of course, may be made from the floor at the time of the election.

Newspaper Published by Upjohn

A new publication, a weekly newspaper for physicians and their associates in the medical profession, was introduced on January 2 by the Upjohn Company, Kalamazoo. The paper is called *SCOPE Weekly* and is prepared by Physicians News Service, Inc. It contains reports of events and developments in medicine and science from regional, national, and international sources.

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

Bills that have been hanging fire in Senate and House committees for over a year finally are getting attention as the administration pushes its program for broader and more uniform medical care for the families of servicemen.

A new version of a bill was dropped in the hopper on the opening day of this session by Chairman Carl Vinson of the House Armed Services Committee. It was designed in part to supply answers to a number of questions growing out of earlier versions sponsored by the Defense Department. Actually it raised more questions, which only hearings and testimony from expert witnesses and debate on the floor of Congress can answer.

The bill (H. R. 7994) authorizes, as a matter of right, broad medical care for dependents of the armed forces as well as of Coast Guard, Public Health Service, and Coast and Geodetic Survey personnel serving on active duty. (The bill would authorize health insurance only for dependents of latter three services.) Separate bills have been introduced in the past providing medical care for dependents of Coast Guard, PHS and Geodetic Survey, but this marks the first time they are brought into the same bill with military personnel.

In provision of services, the bill has no surprises over its predecessors. It calls for diagnosis, treatment of acute medical and surgical conditions, treatment of contagious diseases, and maternity and infant care.

On another point of major interest to physicians, the bill drops out all mention of the home-town medical care plan, which was a part of Mr. Vinson's earlier bill. That bill contemplated use of civilian hospitals and doctors for those dependents who were not near military medical facilities and who had not taken out health insurance, with the government paying part of the cost.

Another area of almost certain debate in the latest bill is the insurance features. There are these main points:

1. A serviceman may elect to rely entirely on the chance of finding space available in a military hospital or clinic for his family, or he may choose protection through an insurance plan.

2. The family deciding on insurance has its choice

of going to a military hospital or using civilian resources. The uninsured family could be charged by the military for out-patient care, and would have to pay subsistence costs while in the hospital.

3. A serviceman taking insurance would pay 30 per cent of monthly premiums for a basic plan covering his wife and children, and the entire premiums for coverage of dependent parents and parents-in-law. Parents and parents-in-law who found space in a military hospital, however, would be admitted on the same basis as wives and children.

4. Catastrophic-type coverage, at additional premium.

5. To take care of long term illnesses, the bill provides for transfer of dependents to military facilities once they have used up benefits in an insurance plan. Or if such transfer isn't feasible, the government could pay the additional costs for private care.

The bill was introduced before the Defense Department had completed a survey of Blue Shield, Blue Cross, and commercial plans to determine to what extent they could provide care under the bill. Conceivably the survey could further change the shape of an already much-revised piece of legislation.

President Eisenhower in his State of the Union message summed up the case for dependent medical care this way: "Much has been done to attract and hold capable military personnel, but more needs to be done." He also broadly outlined administration plans in the health field, with emphasis on more money for research and federal aid to medical schools and to private research facilities for construction. With bipartisan bills along this line already before Congress, these proposals may move right along before adjournment in mid-summer.

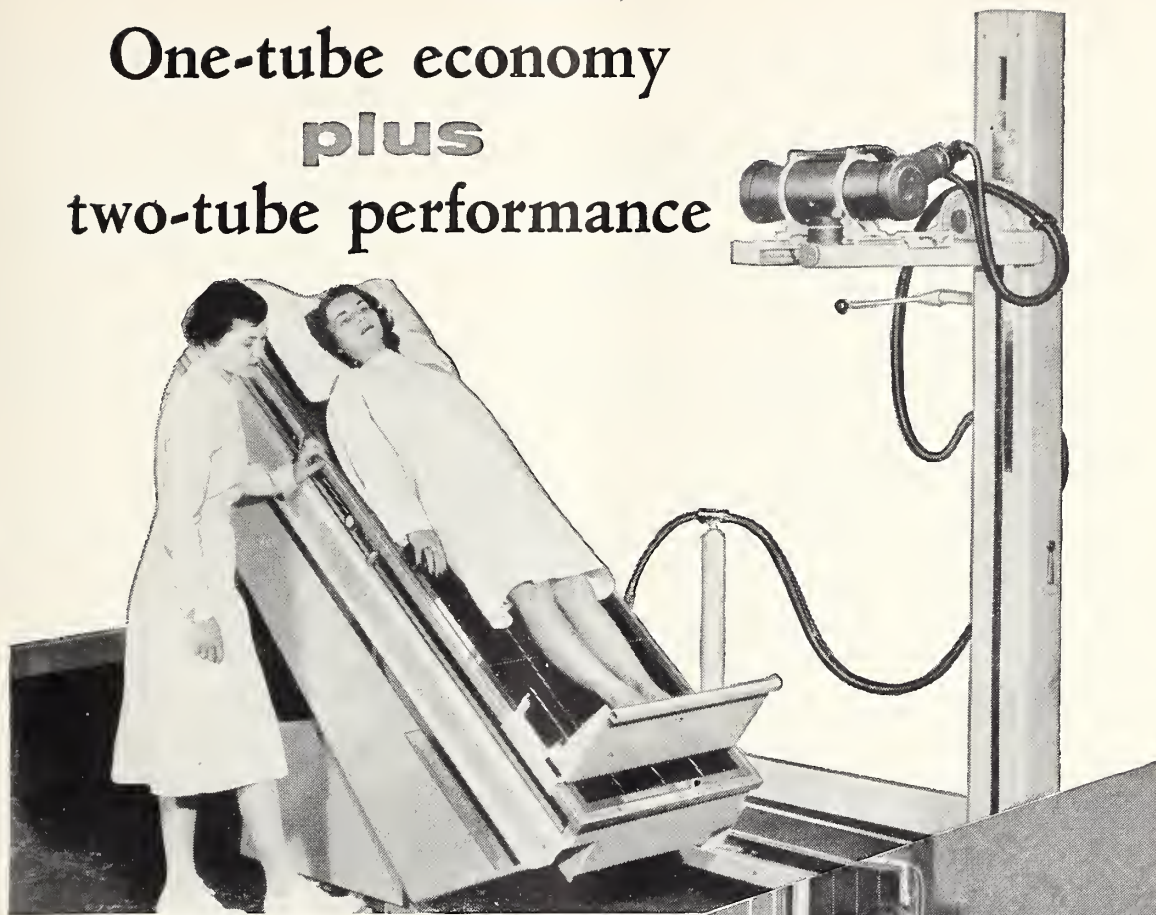
However, Congress might decide that for this year medical schools should settle for the \$90 million of Ford Foundation money being made available to private schools to help strengthen teaching staffs.

By the same token, there was some question just how much Congress would vote for Hill-Burton hospital programs this session in the light of the \$200 million Ford grants to some 3,500 non-profit hospitals.

A recent Public Health Service report indicates that states are now showing less preference for "public" Salk vaccine programs than they did a few months ago. The sixth allotment marked the high point in "public" preference. Then came a slight but steady decline.

Annual meeting, Kansas Medical Society, Topeka, April 29-May 3, 1956.

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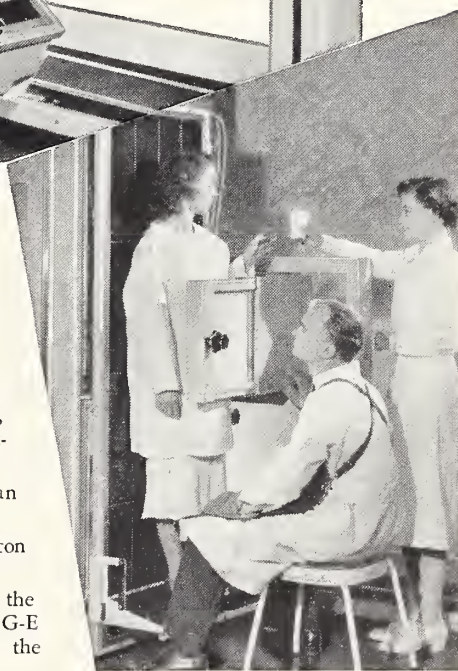
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COUNTY SOCIETIES

The Shawnee County Medical Society, at a meeting held in Topeka on January 3, voted an assessment for each member in 1956 as a means of securing a sizable contribution for the American Medical Education Foundation. Active members will pay \$15 each, associate members \$7.50. Emeritus members are exempt from paying the assessment.

The scientific presentation of the evening was given by Dr. Robert J. Crossen, St. Louis, who spoke on "Vaginal Plastic Operative Work."

Dr. Robert Cotton, Topeka, was elected to membership.

Dr. Leland Speer, Kansas City, was elected president of the Wyandotte County Society at a meeting held in November and took office on January 7 at a dinner meeting at the Town House Hotel. Others elected are: vice-president, Dr. William P. Williamson; secretary, Dr. Francis J. Nash, and treasurer, Dr. James B. Pretz.

A seminar on legislative and medicolegal subjects was a feature of the January 3 meeting of the Sedgwick County Society in Wichita. Mr. Harvey T. Sethman, Denver, executive secretary of the Colorado State Medical Society, spoke on "Your Legislative Problems," and Mr. William Tinker, Wichita attorney, discussed "Recent Trends in the Law as it Relates to the Practice of Medicine."

The following physicians, elected at a previous meeting, took office at that time: president, Dr. J. P. Berger; vice-president, Dr. William J. Reals; secretary, Dr. J. H. Holt; treasurer, Dr. Dean A. Huebert. Serving on the Board of Directors are: Doctors W. P. Callahan, Jr., H. C. Clark, G. F. Gsell, L. K. Crumacker, H. F. O'Donnell, C. L. Woodhouse, G. E. Cowles, G. L. Thorpe, and L. E. Vin Zant.

Dr. L. J. Beyer, Lyons, was elected president of the Rice County Society at a meeting held recently in Lyons. Dr. James T. Grimes, Lyons, was named vice-president, and Dr. Preston E. Beauchamp, Sterling, was chosen secretary-treasurer.

Members of the Saline County Society were hosts to the Golden Belt Medical Society at a meeting held at the Lamer Hotel, Salina, on January 12. Dr. Walter Mau, Topeka, spoke on "Emergency Urology Problems," after which a group of pediatricians cooperated to discuss common illnesses and problems of infants and children. Dr. Lucius E. Eckles, Topeka,

was moderator. Participants were Dr. Donald Diefendorf, Waterville; Dr. O. L. Martin, Salina; Dr. Harry O'Donnell, Junction City, and Dr. Forrest Taylor, Clay Center.

Dr. Darwin L. Richardson, Minneola, entertained members of the Comanche-Kiowa-Clark Society at a dinner meeting at Minneola recently.

Members of the Marion County Society entertained their wives at a dinner meeting at Marion on December 19. An octet from Sacred Heart School, Wichita, presented a musical program.

A meeting of the Barton County Society was held at Great Bend on January 9. Mr. Rueben M. Dalbec, executive assistant of the Kansas Medical Society, and Mr. Hart Workman, attorney for the Kansas State Board of Social Welfare, spoke on different phases of medical care for the indigent. A question and answer period followed.

Officers of the Crawford County Society for 1956 were elected at a meeting held at Pittsburg on December 29. The following were named: president, Dr. William T. Braun, Pittsburg; vice-president, Dr. Jack D. Walker, Girard; secretary-treasurer, Dr. Clifford B. Newman, Pittsburg.

Dr. David S. Ruhe, head of the Department of Audio-Visual Education at the University of Kansas Medical Center, was speaker at the January 17 meeting of the Wyandotte County Society at Battenfeld Auditorium. He discussed "Color Television and the Medical Profession."

A meeting of the Wilson County Society was held at the Methodist Church in Neodesha on January 11 with members of the Auxiliary as dinner guests. Mrs. Goldena Olinger, county director of welfare, was speaker of the evening.

A meeting of the Montgomery County Society was held in Coffeyville on January 18. Dr. J. E. McDonald, Tulsa, a member of the legislation committee of the American Medical Association, spoke on social security proposals to be considered by Congress.

The A.M.A. clinical session in Boston in December drew a total registration of 8,637, including 3,779 physicians. Corresponding figures for the Miami meeting in 1954 were 7,707 and 3,253.



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Psychomotor Epilepsy

ROBERT C. BRANDMEYER, M.D., *Panama Canal Zone*

Psychomotor seizures may be defined as episodes of complex, usually well coordinated, automatic motor activity produced as the result of an epileptic discharge within the central nervous system. The term "automatic activity" is used here in the sense that it is motor behavior over which the individual has no conscious control. The question of whether the patient is actually conscious or unconscious during the seizure awaits the determination of more generally agreed upon qualifications for these terms. However, it is known that the state of consciousness is altered at least to the extent that the patient has lost his capacity for making a durable memory record for events occurring during the course of an attack, and he has total amnesia for all that has transpired.²⁸

There is no general pattern of behavior characteristic of all cases of psychomotor epilepsy, although there is usually some consistency in the manifestations of the individual attacks occurring in a single patient. The periods of automatic behavior and amnesia may be quite short in duration, lasting only about 60 seconds, or they may continue for several hours.⁹ Again there is usually some consistency in the time interval involved in individual cases.

During the shorter episodes the patient may exhibit relatively unelaborate patterns of motor activity, a common example being masticatory movements with smacking of the lips and swallowing while at the same time giving a general appearance of confusion. During the prolonged attacks a patient may exhibit extremely complex and bizarre behavior such as running in circles, disrobing, or engaging in some well coordinated activity which appears purposive but irrational or inappropriate for the time and place. The patient may continue with something he was doing at the onset of the seizure but not respond to a command to alter the pattern of his activity. Speech may be slurred but is usually not affected except in content, which is often obscure or meaningless. In some cases the automatic behavior is characterized by an emotional display of rage and violence, during the course of which the patient may be aggressive, may attack other persons, or engage in other forms of destructive activity. Observation of clonic or tonic

convulsive movements during or preceding a psychomotor attack has been reported in a few cases, but they are relatively rare.

The only clinically observable accompaniments which consistently occur in all episodes of psychomotor automatism are a period of obvious confusion at the end of the episode and total amnesia for the experience. Frequent though not invariable features are those of wandering about with a general appearance of confusion, together with an apparent inability to relate the environment and events to past experience.

An aura may or may not occur at the onset of the seizure. If present it may be one in which the patient experiences some non-specific sensation such as a feeling of fullness of the head, an abnormal epigastric or intra-abdominal sensation, or simply an awareness of an impending seizure. More often, however, the attacks of psychomotor automatism are ushered in by elaborate and complex psychical phenomena. These may consist of sudden involuntary vivid recollections of past events, perceptual illusions, hallucinations, or illusions of interpretation in which there is a distortion of the patient's ability to relate present to past experience which results in feelings of unusual familiarity, absurdity, or fearsomeness about his surroundings.

In about one-third of all cases of psychomotor epilepsy there are no clinical manifestations of epilepsy other than the psychomotor seizures. The remaining approximate two-thirds of these patients also have grand mal seizures apart from the psychomotor attacks. While petit mal seizures and other epileptic variants may occur clinically in a patient with psychomotor epilepsy, such combinations are rare.¹³

In view of the absence of the more generally recognized signs of grand mal and petit mal epilepsy during nearly all episodes of psychomotor automatism, together with the tendency of the attacks to resemble psychiatric rather than primarily neurological disturbances, it is surprising that recognition of the entity as a type of epilepsy occurred as early as it did. In 1888, Hughlings Jackson suggested that what appeared in some patients to be periodic episodes of psychotic or hysterical behavior might be the manifestations of a particular type of epileptic seizure. Jackson confirmed this suspicion to his own satisfaction, and by a process of clinicopathological correlation concluded that the focus of the discharging

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Brandmeyer is now serving his internship at Gorgas Hospital, Panama Canal Zone.

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lesion in psychomotor epilepsy was located in the temporal lobe.¹⁷

In the interval between the clinical recognition of psychomotor epilepsy and the development of an adequate method of electroencephalographic study there was no uniformity of opinion as to whether the psychomotor attacks represented a certain type of seizure, manifestations of postseizure phenomena, or substitutes for seizures. Electroencephalographic exploration has resulted in recent years in the determination of definite correlations between fluctuations in electrical potential over areas of the human brain and the clinical picture of psychomotor epilepsy.

In 88 per cent of patients with clinical psychomotor seizures there is a detectable focus of interseizure discharge which is located in the anterior temporal region either unilaterally or bilaterally. A focus of abnormal interseizure activity in this location has been given the name "psychomotor focus." Also, a type of seizure discharge distinct from the rapid frequency of grand mal and the alternate slow and fast frequency of petit mal has been found to be typically associated with psychomotor seizures and has been labeled the "psychomotor seizure pattern" of discharge. It is composed of cortical action potentials which are of high voltage and slow frequency, from three to six per second.^{11, 12}

With the use of activation techniques such as hyperventilation or intravenous injection of small doses of metrazol, it has been possible to induce clinical seizures in patients while electroencephalographic recordings are being taken. These records and observations usually reveal a typical sequence of events. The psychomotor interseizure focus is usually composed of random positive spikes. If the spikes remain confined to the temporal lobe, there are no clinical seizure manifestations. If a clinical seizure is impending, the spikes occur with progressively increasing frequency and are finally replaced by the high voltage three to six per second waves which spread to all cortical areas. It is at this point that clinical manifestations usually appear, although in some instances this type of dysrhythmia may continue for several seconds without simultaneous clinical manifestations.¹¹

After the period of generalized discharge, the electroencephalographic record typically becomes flattened in all leads and is characterized chiefly by a relative absence of detectable cortical activity, a period of so called postictal exhaustion or paralysis.

There may be no clinically apparent change in the nature of the clinical seizure as the generalized discharge pattern is replaced on the record by the postictal period of cortical inactivity. The automatism gradually merges into a period of confusion and

finally to a full recovery of conscious processes as the record shows return to a normal electrical activity.¹³

These electroencephalographic findings of a psychomotor focus and a psychomotor seizure pattern, while demonstrable in the majority of cases, are not invariably present. In an occasional case of psychomotor epilepsy the only demonstrable discharging cortical focus is located in the frontal lobe (less than one per cent) or in the occipital lobe (less than one per cent),¹³ and recently there have been reported two cases of clinical psychomotor epilepsy in which the pattern of seizure discharge was that of the petit mal type.⁸

Not all cases of epilepsy with a demonstrable temporal lobe focus fall into the clinical category of psychomotor epilepsy. However, in cases with a discharging focus in the anterior one-third of the temporal lobe, 90 per cent have clinical psychomotor automatism. In the remaining 10 per cent there may be only grand mal or other varieties of clinical seizures associated with the demonstrable psychomotor focus.^{13, 17}

It has recently been shown that the temporal lobe discharge in psychomotor epilepsy may be primary, with the focus of origin of epileptogenic discharge located in the anterior temporal lobe, or the temporal lobe discharge may be secondary to a primary epileptogenic focus located within the deeper structures of the brain stem.^{12, 14, 26} The pattern of ictal discharge is identical in both types.

There is a primary focus of discharge on one temporal cortex in about 75 per cent of the cases. In these there is abnormal interseizure activity over only one temporal cortex, or predominantly on one side with secondary extension of the abnormal discharge to the opposite temporal cortex. In the remaining 25 per cent there is a primary focus of discharge in the higher brain stem. The interseizure discharge in these cases is characterized by a simultaneous synchronous discharge in both temporal lobes, or by a discharge occurring alternately in first one and then the other temporal lobe.^{14, 18, 27, 29} A neuron system within the higher brain stem which is functionally related to the anterior temporal cortices has been demonstrated in man,³² and the production of epileptiform spikes in the anterior temporal lobes bilaterally, secondary to stimulation of the septal nuclei and specific local areas of the thalamus and basal ganglia, has been accomplished in studies with cats and monkeys.¹

It is believed that in all attacks of psychomotor automatism both the cortical and brain stem structures become involved, the difference being in the order of involvement.^{2, 13, 17, 29} The development of the automatism and amnesia apparently occurs subsequent to the involvement of the midbrain structures.²⁹

12/15/55 Discharge Note:
This 44-year-old man was admitted
on 12/8/55 with a history of fever, back pain
and dysuria of three days' duration. Urine culture
revealed mixed infection with gram-positive
and gram-negative organisms. Diagnosis: pyelonephritis.
Oral Terramycin therapy was instituted (2 Gm. the
first day, 1 Gm. daily for four days thereafter) in
divided doses q. 6 h. Patient was afebrile in 24 hours;
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In the case of a primary temporal lobe focus, the period of automatism is initiated by the spread of the discharge from the temporal cortex to the mid-brain structures with which it is connected. Prior to this extension, the local abnormal activity in the temporal lobe either may or may not result in the production of an aura. In cases with a primary focus in the brain stem structures and only secondary discharge in the anterior temporal lobes, there is never an aura, the initial discharge of the epileptogenic focus within the deeper structures being immediately productive of the automatic state.

Electroencephalographic studies of psychomotor epilepsy have shown, then, that the production of psychomotor automatism is almost invariably associated with the presence of a primary or secondary discharging focus in the anterior temporal lobe, and with a distinct rhythmic pattern of seizure discharge. While psychical phenomena which often precede psychomotor attacks are apparently produced as the result of abnormal neuronal activity in the temporal lobe, the production of the actual automatic state seems to be dependent upon involvement of the higher brain stem nuclei to which the anterior temporal lobes are functionally attached. Studies have also revealed that clinical automatism may occur not only during the period of generalized seizure discharge but also may extend into the postictal period while there is still an alteration of function of the central nervous system consequent to the discharge.

Further speculation as to the nature of the functional alteration in the central nervous system responsible for the production of psychomotor automatism has come from the experimental studies of Dr. Wilder Penfield and his associates. They observed the effects of direct electrical stimulation of the human cerebral cortex during the course of surgery under local anesthesia.^{24, 25, 26, 27, 28, 29}

Electrical stimulation of the temporal lobe cortex may produce any of the complex psychical phenomena which frequently occur as an aura at the onset of a psychomotor seizure. Some patients experience sudden and involuntary recollections of happenings in their recent or distant past. These memories are much more vivid than those the patient could produce voluntarily. Patients describe them as a reliving of the remembered episode in much the same way as a scene is recalled in a dream. There may be auditory or visual hallucinations or both, but the hallucinations are always concerned with a specific past experience. The stimulation results in the production of no new material in the mind of the patient.

Illusions of interpretation may also occur, either as an aura preceding a psychomotor seizure or as the result of electrical stimulation of the temporal cor-

tex. One of the most commonly encountered experiences of this type is the so called *déjà vu* phenomenon in which patients have a sudden feeling of unreal familiarity with their surroundings and situation, as if they were living through this part of their lives for the second time.

Penfield has suggested that all psychical phenomena produced represent some type of abnormal function of memory mechanisms due to abnormal stimulation either by a stimulating electrode or an epileptic discharge. In some instances abnormal temporal lobe stimulation seemingly produces an activation of specific memory patterns. In other instances it results in an aberration in the processes of interpretation of the environmental situation because of some distortion of the patient's ability to accurately relate present to past experiences.

From these speculations Penfield has suggested that the temporal cortex and the neuron complexes in the midbrain with which it is related constitute the memory organ of the central nervous system, and that psychomotor automatism is produced as the result of ictal and postictal paralysis of the function of memory recording.^{27, 29}

While a more complete understanding of the exact mechanism of production of psychomotor automatism is lacking at present, there has been much interest in recent years in the relative incidence of the disease and the development of methods of treatment. Recent estimates of the incidence of psychomotor epilepsy, either alone or in conjunction with other forms of clinical seizures, suggest that they occur in 25^{13, 27} to 40 per cent^{2, 19} of the epileptic population. These figures are much higher than those of only a few years ago. It has been suggested that the increase is due principally to a more general awareness of the variable manifestations of the entity, together with the development of electroencephalographic techniques to detect an abnormally discharging focus in a higher percentage of cases.

Psychomotor epilepsy occurs most commonly in adults, with a slightly greater incidence in males than in females. The first attack usually occurs after the age of 20 years and rarely earlier than 10 years of age. In over 30 per cent of the cases the first attack occurs sometime during the third decade of life.^{13, 33}

Studies of etiological factors responsible for the production of a discharging focus in cases of psychomotor epilepsy have resulted in the classification of 75 per cent of the cases as idiopathic. In those cases in which etiology has been presumed, trauma, encephalitis, birth injury, brain tumors, and brain abscesses have been designated as more frequent causes, while vascular accident, arteriosclerosis, mastoiditis,

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and meningitis have been believed responsible in occasional cases.^{13, 31}

Hereditary factors seem to be of about the same importance in psychomotor epilepsy as in other forms of epilepsy, a positive history of some form of epileptic seizure being elicited from close relatives of these patients five times as frequently as in the general population.²⁰ In many cases both a transmitted predisposition and brain damage seem to be important contributory factors in the origin of the seizures.²⁰

There are certain other clinical conditions which are frequently confused with psychomotor epilepsy. Short episodes of psychomotor automatism are frequently misdiagnosed as petit mal seizures. The clinical points of differentiation are that psychomotor epilepsy usually occurs in adults while petit mal seizures occur most commonly in children. Psychomotor attacks usually occur with a frequency of once a month to once or twice a week, and rarely more frequently than once a day,^{9, 13} while petit mal seizures often occur with a frequency of several times a day. Even brief psychomotor attacks usually last for 60 seconds or longer, while petit mal seizures are usually of shorter duration than 60 seconds. There is no period of confusion following petit mal seizures, while this is an invariable accompaniment of psychomotor attacks. There is frequently an aura with psychomotor epilepsy while an aura is almost never associated with petit mal. Finally, electroencephalographic differentiation is usually possible.^{9, 16, 33}

Differentiation between psychomotor attacks and psychoneurotic behavior is often difficult, particularly since severe personality disturbances are present in about 50 per cent of patients with psychomotor epilepsy, and of this 50 per cent one-half have a history of psychosis, while positive clinical neurological findings are nearly always absent.^{9, 10, 13, 33} Many patients, particularly those with severe neurotic tendencies, are reluctant to admit having experienced psychical phenomena through fear of being considered psychotic. When psychomotor epilepsy is suspected, it is frequently necessary to ask the patient directly about the occurrence of bizarre episodes and reassure him that his seizures are actual experiences and not breaks with reality.

The chief points of differentiation between psychomotor seizures and bouts of psychoneurotic behavior are: (1) Psychomotor seizures are episodic with a fairly well defined beginning and ending. (2) Each attack tends to follow a similar pattern. (3) The attacks are usually unrelated to environmental factors. (4) There may be an aura. (5) There is amnesia for the psychomotor seizure.^{9, 16, 33} Eliciting a family history of any form of seizures or a personal history of head injury or convulsions secondary to fever or

toxic conditions should also suggest the possibility of psychomotor seizures in an individual whose emotional disorder clouds the clinical picture.^{20, 31}

The differential diagnosis between psychomotor epilepsy and hysteria can be most difficult. In both the attacks may be periodic. Hysterical episodes often begin with the resemblance of an aura, and there may be amnesia for the experience. An electroencephalographic diagnosis is frequently not easy, for a small number of psychomotor epileptics retain normal records in spite of activation techniques, while some hysterical individuals show electroencephalographic anomalies similar to those of epileptics. One point of differentiation is that under the influence of hypnosis the hysterical individual may be able to recall his experience during an attack while the psychomotor epileptic cannot. In some cases, only response to therapy will be of assistance in making a final diagnosis.

In the absence of a disease entity making surgical intervention mandatory, such as an operable brain tumor or a subdural hematoma, all authors agree that a medical therapeutic trial should be attempted with cases of psychomotor epilepsy, and elective surgery may be considered only when all else fails.^{7, 12, 15, 17, 26} General supportive measures in conjunction with medical therapy should include avoidance of alcohol, physical fatigue, and situations which put an undue emotional strain on the patient, since all of these have been shown to predispose toward attacks.^{2, 10} In some patients with severe emotional disorders, a psychiatrically oriented therapeutic and supportive program seems to be the most valuable measure in control of the seizures.

The response of psychomotor epileptics to drug therapy is variable, and treatment with standard preparations must be individualized. In general it may be said that results of medical treatment have been less gratifying in the case of psychomotor epilepsy than with other types of epileptic seizures. Bromides are beneficial in rare instances but have been noted to accentuate personality disturbances in others.²⁰ Phenobarbital, either alone or in conjunction with other drugs, often results in an increase in frequency of the seizures,¹² although in one series of 25 patients, 17 reportedly showed improvement while taking Dilantin and phenobarbital.⁷ Dilantin alone is beneficial in some cases and apparently ineffective in others.^{7, 30}

Trials with Tridione, Paraldione, and Mesantoin, either alone or in conjunction with other drugs, indicate that they are rarely effective and may cause an increase in the frequency and severity of attacks.^{7, 30, 33} Milontin (N-methyl alpha-phenylsuccinimide) has been reported as being of marked value in reducing

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the incidence of psychomotor seizures,⁴ but this drug is also said to have extremely toxic side effects.³⁰

Phenurone has been the most effective drug produced with respect to control of psychomotor seizures, but it is also capable of producing a number of alarming side effects which have caused several authors to be reluctant to endorse its use even under close supervision.^{7, 12, 30, 33} Among the side effects noted have been severe depressive states, psychosis, extreme agitation and restlessness, leukopenia, aplastic anemia, and severe hepatic damage.

Most authors agree that an initial trial with Dilantin is a preferred procedure, and a combination of Dilantin and phenobarbital may produce good results. A mixture of Dilantin, phenobarbital, and Phenurone has been suggested as effective in some otherwise refractory cases.¹²

When Phenurone is administered, close supervision is indicated, and the appearance of any of the toxic symptoms listed should indicate discontinuation of the drug.

It has been noticed that effective medical control, regardless of the drug used, produces an exaggeration of psychoneurotic symptoms in some patients.¹²

The presence of multiple types of seizures is apparently a favorable prognostic sign with regard to medical therapy.^{7, 12} In cases of the mixed occurrence of grand mal and psychomotor seizures, good results are obtained in the majority of cases with the use of Dilantin alone. The frequency of occurrence of seizures and the age of onset of attacks are not significantly related to the results of drug therapy, but the duration of the seizures prior to institution of therapy seems to be important. If the patient has had seizures for 10 years or more, there is a sharp drop in expected percentage of beneficial results.⁷

Patients with incapacitating and medically refractory cases of psychomotor epilepsy may, in carefully selected cases, be helped by surgical treatment. The surgical procedure followed is the removal of the anterior portion of the involved temporal lobe. The most necessary requirement for elective surgery is, therefore, the electroencephalographic demonstration of a definite cortical focus of interseizure discharge which occurs persistently on only one side, or predominantly on one side with only secondary involvement of the opposite temporal lobe.^{2, 15, 17, 26} Recognition of the fact that the temporal lobe discharge in psychomotor epilepsy may be secondary to an epileptogenic focus within deeper structures has explained many earlier surgical failures.¹⁵ The presence of an aura is additional evidence suggesting a primary temporal lobe focus of discharge. The electroencephalographic demonstration of bilateral synchronous temporal lobe discharge at the initial stage of devel-

opment of a seizure, together with the absence of a history of aura manifestations at the onset of a seizure, constitutes a strong contraindication to temporal lobectomy for alleviation of psychomotor symptoms, even in the presence of known organic pathology in one temporal lobe.^{17, 25}

Surgical results indicate also that when features of rage or an intense emotional display are prominent in the seizures, surgery is rarely beneficial.

For most patients who had a definite operable focus in only one temporal lobe and whose seizures had no prominent emotional features, postoperative results have been good. Complete or nearly complete postoperative control of seizures with medical therapy has been reported in 75 per cent of these patients, with some decrease in frequency and severity of attacks in nearly all. The best surgical results were obtained in cases in which electroencephalographic recordings were made during surgery to insure complete excision of the focus of abnormal discharge.

As with medical control, surgical alleviation of seizure symptoms occasionally results in an increase in severity of psychoneurotic tendencies.

Except in cases where the temporal gyration of the optic nerve was severed, producing homonymous hemianopsia, or the receptive speech center was removed, resulting in receptive aphasia, there have been no apparent neurological or intellectual deficits produced by the removal of one anterior temporal lobe.

In only one-third to one-half of the cases was there an anatomical lesion demonstrable either grossly or microscopically at the site of primary epileptogenic discharge in the temporal lobe.

Psychomotor epilepsy has been described as an epileptic variant in which the manifestations of epileptic discharge are those of complex motor activity during a period for which the patient has complete amnesia. The seizures may or may not be associated with psychical phenomena. Psychomotor discharge is typically associated with interseizure random spikes in one or both temporal lobes. The primary origin of abnormal discharge may be either in a temporal lobe focus or an epileptogenic focus within the higher midbrain. There is a typical pattern of seizure discharge associated with the attacks.

Psychomotor epilepsy is frequently mistaken for a psychiatric disorder because of the bizarre nature of symptoms and the high incidence of personality disorder in such patients. A recent increase in interest in psychomotor epilepsy has resulted in the determination of a much higher incidence than was formerly suspected.



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Psychomotor epilepsy seems in general to be more resistant to drug therapy than are other types of epileptic seizures. A program of general supportive and medical therapy is beneficial to some extent in the majority of cases.

Surgical treatment is advocated in selected cases among those refractory to medical management.

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1. Moyer, J.H., in discussion of Galen, W.P., and Duke, J.E.: Outpatient Treatment of Hypertension with Hexamethonium and Hydralazine, *South. M.J.* 47:858 (Sept.) 1954.

2. Moyer, J.H.; Dennis, E., and Ford, R.: Drug Therapy (Rauwolfia) of Hypertension. II. A Comparative Study of Different Extracts of Rauwolfia When Each Is Used

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3. Wilkins, R.W.; Stanton, J.R., and Freis, E.D.: Essential Hypertension. Therapeutic Trial of Veriloid, a New Extract of *Veratrum viride*, *Proc. Soc. Exper. Biol. & Med.* 72:302 (Nov.) 1949.

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ANNOUNCEMENTS

Annual meeting, Atlanta Graduate Medical Assembly, Biltmore Hotel, Atlanta, Georgia, February 20-22.

Harvard University School of Public Health scholarships available for academic year 1956-1957. Closing date for applications, March 1. Address inquiries to 55 Shattuck Street, Boston 15.

Sectional meeting, American College of Surgeons, Colorado Springs, March 5-7. Symposia, panel discussions, cine clinics. Address inquiries to Dr. H. Prather Saunders, A.C.S., 40 East Erie Street, Chicago 11.

Tenth annual symposium on fundamental cancer research, University of Texas M.D. Anderson Hospital and Tumor Institute, Houston, March 29-31. General topic, "Cellular Metabolism of Tumors." Reports on research projects being conducted.

Graduate instructional course and 12th annual meeting, American College of Allergists, Hotel New Yorker, New York City, April 15-20. Address inquiries to Dr. F. W. Wittich, 401 LaSalle Building, Minneapolis 2, Minnesota.

Centennial celebration and scientific congress, Hawaii Medical Association, Honolulu, April 22-29. Scientific program, pageant, traditional Hawaiian feast, planned tours. Address inquiries to 510 South Beretania Street, Honolulu 13, Hawaii.

Teaching seminar, International Academy of Proctology, Drake Hotel, Chicago, April 23-26. Program on anorectal and colon surgery. Physicians invited. No fee. Address inquiries to 147 Sanford Avenue, Flushing, New York.

Annual meeting, American Goiter Association, Drake Hotel, Chicago, May 3-5. Physiology and diseases of thyroid gland. Address inquiries to Dr. John C. McClintock, 1491½ Washington Avenue, Albany, New York.

Prize for essay on any subject relating to physical medicine and rehabilitation offered by American Congress of Physical Medicine and Rehabilitation. Contest closes June 1. Address inquiries to 30 North Michigan Avenue, Chicago 2.

First International Congress of Human Genetics, Copenhagen, Denmark, August 1-6. Address inquiries to University Institute for Human Genetics, 14, Tagensvej, Copenhagen, N., Denmark.

Ninth annual meeting, American Association of Blood Banks, Somerset Hotel, Boston, September 3-5. Address inquiries to Miss Marjorie Saunders, 725 Doctors Building, 3707 Gaston Avenue, Dallas, Texas.

Tenth congress, International College of Surgeons, held in conjunction with 21st congress, United States and Canadian sections, Chicago, September 9-13. Address inquiries to 1516 North Lake Shore Drive, Chicago 10.

Scientific and clinical session, American Congress of Medicine and Rehabilitation, Ambassador Hotel, Atlantic City, September 9-14. Open to members of A.M.A. Address inquiries to 30 North Michigan Avenue, Chicago 2.

A meeting of members of the American College of Physicians of this region, originally scheduled for March 23, will be held on March 9 in Kansas City. A scientific program will be presented during the day and a dinner will conclude the event.

Regional meeting, International College of Surgeons, Madison, Wisconsin, April 26-28. All surgeons invited. Address inquiries to Dr. Arnold S. Jackson, Jackson Clinic, Madison, Wisconsin.

Annual spring congress in ophthalmology, otolaryngology, and allied specialties, Gill Memorial Eye, Ear and Throat Hospital, 711 South Jefferson, Roanoke, Virginia, April 2-7.

Nine one-day courses will be presented by the American Academy of Neurology at St. Louis, April 23-25. To be covered are neuropathology, neurophysiology, neurochemistry, electrodiagnosis, neurological diseases of infancy and childhood, injuries to the central nervous system, extra-pyramidal disorders, infections of the nervous system, and convulsive disorders. Additional one-day course on common neurological syndromes for general practitioners. Address inquiries to 3501 East 54th Street, Minneapolis 17, Minnesota.

Fourth annual interim meeting of District VII, American Academy of Obstetrics and Gynecology, Peabody Hotel, Memphis, March 9-10. Scientific papers, case reports, round table luncheons, banquet on March 9. Wives invited.



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BOOK REVIEWS

Textbook of Endocrinology. By Robert H. Williams, M.D., and contributors. Published by W. B. Saunders Company, Philadelphia. 776 pages, 175 figures. Price \$13.

This is an excellently written and edited text from the standpoint of applicability to clinical medicine. Each topic is developed logically from anatomy to therapy. It has the difficulty of all texts in that it is already behind the current advances in its field. Also, in condensing the material involved, the authors have been forced to oversimplify. Endocrine therapy in particular is too often presented on an empirical basis with inadequate discussion of contraindications and side effects. Definitive endocrine therapy could have been omitted with no loss to the overall contribution of the text.

This will be a good addition to the library of the practicing doctor and advanced student.—V.E.W.

The Relief of Symptoms. By Walter Modell, M.D. Published by W. B. Saunders Company, Philadelphia. 450 pages. Price \$8.00.

This is a pleasantly written text presented almost as a philosophy of medical practice. The author has

drawn upon many years of experience and personal observations to support both his therapeutic philosophy and his procedures.

The textbook would have been more valid had he not attempted to suggest definitive therapy for specific disease entities. This book is probably worthwhile reading once, especially for the third year student, but would not be recommended for addition to the library of either the student or the practicing physician.—V.E.W.

Booklets for Medical Societies

The American Medical Association has announced publication of two new booklets for medical society use, "Guides for Medical Society Grievance Committees" and "Report of the Survey on County Medical Society Activities." The first reviews the findings and recommendations of the special committee on grievance committees appointed by the Board of Trustees. The second includes data on society meetings, budgets, educational and scientific programs, personnel, building facilities, the work of various committees, and the extent of public relations activities.

Copies of the booklets may be obtained from the Council on Medical Service of the A.M.A., 535 North Dearborn Street, Chicago 10, Illinois.

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Polio in Kansas in 1956

Kansas will still have polio problems in 1956, reports the National Foundation for Infantile Paralysis, in spite of the fact that the number of cases reported in the state in 1955 was about one-third the average number of the previous five years. The Salk vaccine has proved to be a major weapon against paralytic poliomyelitis, but it has not yet won the war against this disease.

The foundation requests the continuing cooperation of physicians in administering vaccine and in caring for patients already paralyzed and those who will be paralyzed in spite of the vaccine. Through funds contributed to the 1955 March of Dimes, the foundation gave more than 175,000 cc. of Salk vaccine to Kansas to initiate a vaccination program.

Statistics supplied by the foundation include the following: the foundation has 106 local chapters in Kansas; more than \$1,910,000 has been spent by local chapters in this state for care of polio patients; 57 foundation scholarships and fellowships have been awarded to Kansas residents; grants of \$825,000 from March of Dimes funds have been made to the University of Kansas for virus research and for polio prevention; in the first ten months of 1955, \$19,550 in emergency aid was sent to seven Kansas chapters by the foundation.

Award of 44 unclassified life science research contracts in the fields of biology, medicine, biophysics, and radiation instrumentation was announced last month by the U. S. Atomic Energy Commission. Included was renewal of a contract for investigation of organic substances tagged with I-131 human thyroid gland in vivo, being conducted by Dr. F. E. Hoecker of the University of Kansas.

Medical School Enrollment

Although American medical schools set all-time enrollment and graduation records in 1954-1955, they may face a student recruitment problem in the next few years, according to a report of the A.M.A.'s Council on Medical Education and Hospitals. The statement is based on the fact that applications to medical schools have been decreasing for the past five years.

There were 6,977 physicians who completed work at 75 medical schools last year, the sixth consecutive year in which a record was set. This is an increase of 1,400 over the number of graduates in 1950. Seven more schools will be graduating physicians by 1960.

Total enrollment during the 1954-1955 year was 28,583, an increase of 356 over the preceding year. The entering class of 7,576 was the largest ever enrolled.



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(1) Poyne, R. W.; Shetler, M. R.; Forr, C. H.; Hellbom, A. A., and Ishmoel, W. K.: J. Lab. & Clin. Med. 45:331, 1955. (2) Bunim, J. J.; Williams, R. R., and Black, R. L.: J. Chron. Dis. 1:168, 1955. (3) Holbrook, W. P.: M. Clin. North America 39:405, 1955.

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Medical Education Week

The period from April 23 to April 29 will be observed this year as Medical Education Week, a joint project of the American Medical Association, the Association of American Medical Colleges, the National Fund for Medical Education, and the American Medical Education Foundation.

This observance is planned as a means of public education, to focus attention on medical schools, to create good will and understanding, and to ease fund raising. The A.M.A. has emphasized, however, that its role in Medical Education Week will be one of public relations, not solicitation.

Increase in Hospital Room Rates

Room rates in general hospitals in the United States have increased approximately 5 per cent in the past year, according to the annual report issued re-

cently by the American Hospital Association. The figure was based on questionnaires returned from 2,639 hospitals.

Rate figures cover the hospital room, meals for both general and special diets, general nursing service, medical records, routine housekeeping, and miscellaneous services.

The highest single room rate in the country was \$35 in New York; the lowest, reported from Louisiana, was \$5.00. The range for multi-bed rooms was from \$23.50 in Ohio to \$2.00 in Tennessee. The highest metropolitan average rate for single rooms was reported in Boston at \$23.14; the lowest, \$12.75 was reported for Atlanta.

Advance deposits were required from patients responsible for their own hospital bills by 47 per cent of the hospitals reporting. This practice tended to be more common among larger hospitals.

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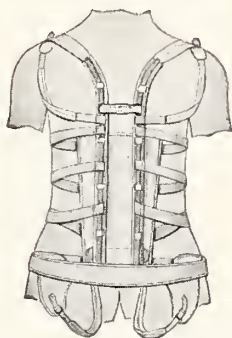
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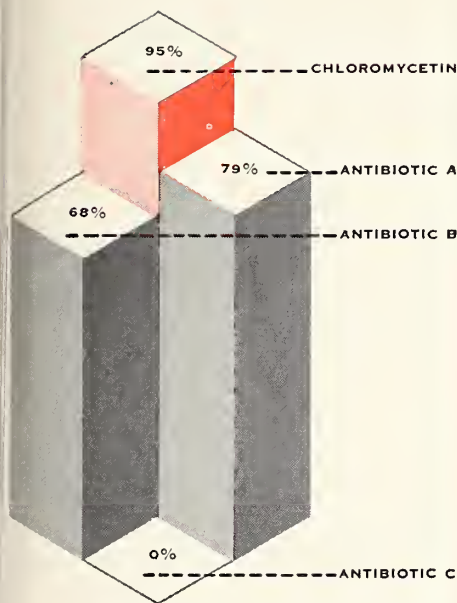
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for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

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TABLE OF CONTENTS

MARCH, 1956

Original Articles	Thesis—Robert W. Brown, M.D., Kansas City 170
University of Kansas School of Medicine— W. Clarke Wescoe, M.D., Kansas City 123	Editorials
University of Kansas School of Medicine: De- partmental Reports 127	School of Medicine Issue 159
Scientific Articles	The Preceptor Program 159
Tumor Conference—Retroperitoneal Seminoma 164	Miscellaneous
Magnesium: Its Role in Metabolism—Senior	Just Browsing 157
	President's Page 158

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Volume LVII

MARCH, 1956

No. 3

University of Kansas School of Medicine

An Outline of Its Facilities, Policies, Accomplishments, and Objectives

W. CLARKE WESCOE, M.D., Dean, Kansas City

It has been customary for several years for the JOURNAL OF THE KANSAS MEDICAL SOCIETY to devote its March issue to the University of Kansas Medical Center. In the past this issue has contained a series of scientific presentations by members of the medical faculty. This year it was the desire of the Editorial Board that the issue be devoted to a factual review in order that the membership of the Society might be better informed concerning Medical Center programs. The faculty was delighted to accede to this request and this issue, therefore, has resulted. It contains, as you will see, reports of activities from all departments of the medical school.

Any report on medical school activities, of course, would be incomplete without some statement from administration. Therefore, briefly, administration presents for you the following résumé concerning accomplishments to date and projections for the future.

THE SOCIETY AND THE SCHOOL

Relationships between the medical society and medical school continue at an unprecedentedly favorable level. Through the Committee on Medical Schools, the Committee on Endowment, the Council, and the secretary's office a close, friendly, and rewarding liaison has been established. The school is grateful for the continuing support of the Society, without which its development and growth would suffer. It is fair to say that these relationships and this support cannot be matched anywhere by any other medical school and medical society. Kansas is fortunate, indeed.

MEDICAL SCHOOL ADMISSIONS

Since 1949 the medical school has admitted entering classes of at least 100. The actual numbers of entering students have ranged from a high of 123 in 1952 to a minimum of 101 in 1955.

Ofttimes the question is asked, "Why are admissions restricted in numbers?" The answer is fairly simple. The number of students admitted must be geared to the facilities available for instruction and the number of faculty members available for teaching. Actually, at present, the medical school's optimum class figure is 100. This figure represents that number for whom laboratory facilities and faculty are available. Any additional student above that figure places an almost insurmountable burden on our first year facilities in Lawrence. More will be said about these facilities later.

Selection of Students. Faced with a limited number of places in a class and a simultaneously limitless number of applicants, it is evident that the careful selection of candidates is one of the primary problems of the medical school. This is true not only of the University of Kansas but also of every other American medical school.

Requirements. The medical school requires that each applicant be enrolled in a college of liberal arts and be at such a stage in his education that his baccalaureate degree will be awarded prior to the opening of medical school classes. The combined degree program, which permitted entrance after three years of collegiate preparation, is no longer offered. The faculty is convinced that a physician needs a broad

liberal education to fit him for his profession. Consequently, no professional degrees such as pharmacy or engineering are accepted for admission. These regulations can be waived in exceptional circumstances but the faculty is reluctant to grant waivers of any kind.

Mechanism of Selection. Committee. The responsibility for admissions to the school has rested for years in a faculty Committee on Admissions. At the present time this committee consists of a chairman, who is assistant dean of the school, and nine other members of the faculty. The faculty members have diversified interests: two are basic scientists; one is a clinician with basic science interests; four are clinicians; two are psychiatrists. The diversity of interest assures a well-balanced committee.

A word, perhaps, should be said regarding the psychiatrists. It is the experience of medical schools that the majority of student problems that arise after admission are based on emotional problems of the individual. For that reason we try diligently to ferret out emotional problems before admission. The unstable, immature individual has no place in medical school.

Procedures. Each applicant for admission transmits to the medical school through his college registrar a transcript of his academic record. This record is evaluated by our own registrar.

In addition, each applicant must take the Medical College Admission Test, developed and administered by the Educational Testing Service of Princeton, New Jersey, for the Association of American Medical Colleges. This test is divided into four parts: verbal ability, quantitative ability, modern society, premedical sciences. Test scores, which reveal the knowledge of the applicant and his aptitudes for medicine, are released to the medical school directly by the testing service.

The medical school requests from the applicant's undergraduate school an evaluation of the candidate. This preferably comes from a committee of that faculty rather than from a single member. The evaluation covers scholarship (fund of information, comprehension, problem solving ability), performance (reliability, application and initiative, judgment, originality), and character (rapport with colleagues, poise, ethical standards, reliability). In each of these categories an evaluation of superior, satisfactory, or unsatisfactory is given.

Finally, each applicant who satisfies the minimum academic requirements for admission is invited to Kansas City for a personal interview. Interviews are held usually during the Christmas recess period. Approximately 50 applicants are interviewed each day in the following manner. Three members of the Committee on Admissions meet jointly with three applicants for a period of 45 minutes. Each appli-

cant is then interviewed for five minutes by the committee chairman and, lastly, each applicant visits with the dean for five minutes.

At the end of the interviews all information is pooled, and on the basis of all records, selections are made.

Residence Requirements. Preference is given to qualified residents of Kansas. In diminishing order, thereafter, preference is given to residents of the surrounding area who have some connection with Kansas, to residents of states that have no medical schools, to other persons.

Comment. One of the major problems facing medical education today is a shortage of *qualified* applicants. Since the rush of the post-war years, the numbers of applicants have dwindled until this year there were only 13,000 applicants for approximately 7,600 places in first-year classes. These figures mean, of course, that medical schools today are accepting 1 out of every 1.8 applicants. The net result is that some schools have no opportunity to be selective. This statement relates particularly to those schools where residence requirements are stringent and the numbers of applicants are low.

The future looks brighter as college enrollments increase, but the time has obviously come for medicine to recruit members for its profession. Every member can serve tremendously by influencing able and outstanding young men and women into medical study. If we are remiss and allow our *best* young people to embark upon other careers, we shall live to see our standards suffer.

THE CURRICULUM

Your medical school, like many others, has spent considerable time in revising its curriculum in an attempt to make it more meaningful to the student. Curricula in the past have grown more by a process of addition and accretion rather than by a process of careful selection and deletion. For two years the faculty at Kansas studied this problem and for two years now our curriculum has been as follows:

The First Year. The curriculum of the first year is designed to present in an integrated fashion the growth and development of the normal human organism. The departments of anatomy, biochemistry, physiology, and psychiatry participate in this program throughout the academic year without regard to ordinary lines of departmental organization. The program consists of the following: (A) orientation; (B) development and structure; (C) behavior of the living organism; (D) communication between the organism and its environment and among its various parts; (E) interchange of materials between the organism and its environment and among its various parts; (F) utilization of materials; (G) excretion of waste products; (H) reproduction.

In a curricular pattern of this type it is possible for the student to learn fundamental facts in an over-all pattern rather than, as in the past, to learn isolated facts in separate courses. All examinations are comprehensive.

The Second Year. Similarly, the second year curriculum is designed to teach the fundamentals of the biology of human disease and the abnormal organism. In this year the departments of pathology, microbiology, pharmacology, and preventive medicine correlate their instruction so that similar subjects are studied from each viewpoint at the same time. Additionally, in this year physical diagnosis, the introduction to clinical medicine, is taught in the same correlative program. Once more, final examinations are comprehensive.

The Third Year. The third year is divided into three trimesters of in-patient clerkship, one of internal medicine, one of pediatrics, and one of surgery. Didactic classroom hours are held to an absolute minimum; teaching is at the bedside. Most of the teaching program is carried on through the techniques of ward rounds, conferences, seminars, and small group discussions.

The Fourth Year. This year is divided into four quarters as follows: one of preceptorship (general practice, state hospital), one of internal medicine (out-patient clerkship), one of obstetrics and gynecology (in-patient and out-patient), and one of surgery (in-patient and out-patient).

Elective Work. Each student is provided the opportunity to take elective courses and to pursue investigation. The summers are free for such activity as well as free time during the formal academic year.

National Board Examinations. For a medical school faculty to be able to analyze its teaching effort and its products, it is essential that it compare itself with other similar programs. One mechanism for so doing is available in *National Board Examinations*. The faculty of the school voted to make these examinations compulsory effective with the class entering in September, 1954. The results of these examinations will not be the measure of pass or fail for a student; rather, they will inform the faculty of its students' performance in comparison to others from many schools. The student, of course, may use the examinations for licensure. We await the first results with interest.

RESEARCH

The medical school carries on an active research program with an annual budget of approximately \$750,000. All of this budget is provided by sources other than the state treasury; the medical school has never been granted an appropriation for research. The sources of research funds are the U. S. Public

Health Service, the various voluntary health agencies, charitable foundations, and private philanthropy. Were it not for this support, the medical school would have no research program of note.

Private philanthropy is becoming increasingly a greater source of research funds. In the last few years notable gifts have been made and bequests given by private individuals to further the research effort. The establishment of memorials of large and small amounts alike has made possible the purchase of necessary equipment and the payment of qualified personnel. To its friends, the medical school is deeply in debt.

All endowments, bequests, and gifts for the medical school are made to the Kansas University Endowment Association through whose good offices the grantor is assured that every cent so given will be spent for the purposes laid down. Many members of the Society have been instrumental in providing such donations and to them we are most grateful.

SERVICE

The third major function of the medical center is to provide medical service to the state and to the profession. All of the service provided relates to the educational effort.

Out-Patient Department. The out-patient department, in which most of the fourth year and some of the third year teaching is accomplished, serves only the medically indigent. Clinic patients are screened carefully by social service to insure that no person capable of paying for medical care is seen. In the course of each year about 100,000 patient visits are made to this department.

In-Patient Facilities. Hospital patients are of two main types: the indigent (referred by county welfare departments) and the paying (referred by practicing physicians). No patient is admitted unless referred by a physician to a physician of the faculty. Each patient admitted is a teaching patient and is seen by medical students, interns, residents, and attending physicians. It is only in this manner that a teaching hospital can be maintained. Approximately 14,000 in-patient admissions occur each year.

Affiliations. The medical center contains only 600 beds. For adequate teaching, therefore, it has been necessary for the medical school to establish affiliations with other hospitals. At present our affiliated hospitals are: the Kansas City Veterans Administration Hospital (medicine, surgery), the Children's Mercy Hospital (pediatrics), the Kansas City General Hospital (obstetrics, pediatrics), and the Menorah Hospital (medicine, surgery). The total costs of such affiliations are borne by the affiliating hospitals who thus make a contribution to medical education.

FACILITIES

The construction of new buildings to bring the medical center up to modern standards, sparked by the legislative appropriation of 1949, has been practically completed. When the psychiatric unit is occupied in March, 1956, that phase of the development program will have been accomplished. The medical center then will have a capacity of 600 beds and adequate facilities for the instruction of the three classes of medical students. Kansas has reason to be proud of its medical center.

Library. The most glaring defect for years in the medical school has been its lack of decent library facilities. This defect has become even more pronounced with the addition of more students.

The present medical library is located on the second floor of the Administration Building, an area not designed for such use. Despite the fact that it is excellently staffed and contains volumes to the total of 40,000, its use is severely hampered by its inadequate and crowded facilities. For instance, there are seats for only 50 persons in the reading room, this with a total student population alone of some 700. There are no study areas available in the stacks.

Fortunately, the Board of Regents and the legislature have approved our request for \$560,000 for a new library unit. The plans for it are ready, and bids are being asked at the present time. Construction can begin immediately after a bid has been accepted; the new unit should be completed by the summer of 1957.

Hopefully, then, we anticipate that by spring we can see this building begin to take shape. It will be located on the southwest corner of the Administration Building, to match Hinch Hall on the northwest. It is projected as a two-story and basement structure to house both the medical library and the Clendenen Library of the History of Medicine. It will contain sufficient space for expansion and will have seating facilities for 225.

Future Plans. With a library unit available it is possible to project, at long last, the final consolidation of the medical school on a single campus. This consolidation is our next proposal.

The weaknesses of a divided school are self-evident. The student, for example, must be oriented to the study of medicine twice, once in Lawrence, once in Kansas City. The student for a period of a year is out of contact with the majority of the faculty and completely divorced from the clinical atmosphere and patients. Similarly, the first year faculty is removed from its colleagues.

The circumstance of geographical division prevents the inception of many new programs and hampers many others. The next step, therefore, will be to ask appropriations for a medical science building to

house the first year on the Kansas City campus. If certain federal legislation is passed, this dream will become a reality within a very few years; otherwise, this program will not be a reality for at least six years. It is a *must*.

After consolidation, the real need for the campus will be research facilities. Generally, all the necessary beds are available and no hospital expansion is anticipated.

Student Funds. The medical school continues to look with disfavor upon scholarships but with favor upon loan funds. Loans imply a responsibility on the part of the borrower; by their repayment other students can be helped. Substantial loan funds have been accumulated, and our financial problems for students seem well on the way to solution.

The John M. Porter Fund. The Kansas Medical Society responded in dramatic fashion to the establishment of this fund after the untimely death of our beloved friend. A sum in excess of \$4,000 is now on deposit to assist students in need. For this additional fund the medical school is deeply in debt to the Society.

THE AMERICAN MEDICAL EDUCATION FOUNDATION

All medical schools are experiencing financial difficulties and yours is no exception. The flexible funds made available by the AMEF have been Godsend. They have made possible programs that otherwise would have been out of reach; they have provided salaries for faculty that otherwise could not have been obtained. The contributions made by the profession can keep the schools alive. The schools need these contributions desperately.

The medical school, perhaps, has nagged about this problem. It is a pleasure to report that Kansas physicians now appear to be setting the pace. Contributions in the last few months exceed any past experience. For this indication of your continuing support all of us are extremely grateful.

GENERAL

It would be negligent, indeed, to close without paying tribute to more members of the profession who have assisted in the teaching program. To the preceptors we are deeply in debt; they have made a tremendous contribution, they have become favorites of our students, and we are grateful. To the lecturers who voluntarily contribute their services we are also in debt and publicly so acknowledge. Finally, to the members of the Menninger Foundation who actively teach in our psychiatry program we are grateful indeed.

The heart of medical education is the support of the physician. We look forward to even closer relationships and to many years of mutual progress for our society and our school.

Department of Anatomy

The six full-time men assigned to teaching medical students unanimously agree that our first and foremost task is to do a good job of teaching. To this we have dedicated ourselves. The integrated curriculum for the first year is outlined below with emphasis on the contributions from the Department of Anatomy.

A. *Orientation*. Five days. A period of orientation during which an attempt is made to acquaint the student with the organization and physical make-up of his medical school, the nature of his work and his goals while in medical school, the type of attitude to be developed, the type of student-faculty relationship to be sought, and the relationship of his work in the basic sciences to clinical medicine.

B. *Development and Structure of the Normal Human Organism*. Thirteen weeks. During this period the student concentrates his effort on the study of the gross and microscopic structure of the normal individual, correlating adult morphology with embryonic development and with behavior. Emphasis is placed upon the unity of the organism and the continuity of development throughout life. During the remainder of the year the study of anatomy is expanded, in conjunction with the detailed study of function, by the use of prosections, the study of models and histological slides, and in joint conferences between students and faculty members from all four departments. Along with structural development, the student is introduced to the development of personality.

C. *General Introduction to the Study of the Behavior of the Living Organism*. One week. General characteristics of living tissues and organisms and the methods used for their study.

D. *The Communication of Information between the Organism and Its External Environment and among the Various Parts of the Organism*. Five weeks. Structural and functional relationships in the central nervous system which enable it to play a major role in integrating the behavior of the whole organism and providing a homeostatic relationship to its changing environment.

E. *The Interchange of Materials between the Organism and Its External Environment and among the Various Parts of the Organism*. Seven and one-half weeks.

1. The structure of the transport systems within the organism.

F. *The Excretion of Waste Products and the Maintenance of the Constancy of the Internal Environment*. Two weeks. Renal structure and function, the

maintenance of water and electrolyte balance, and body temperature regulation.

G. *Reproduction*. One week. The endocrinological regulation of reproduction: gametogenesis, folliculogenesis, fertilization, pregnancy, and reproduction.

Anatomy lectures and laboratory work throughout the year are designed to correlate structure at the gross and microscopic levels with function from the biochemical and physiological standpoints.

The student has available, as a study guide, a syllabus for the material of the first year prepared jointly by members of the four departments.

Examinations are given at intervals throughout the year and a comprehensive examination is given at the end of the year. Promotion to the second year in Kansas City will depend upon the student's performance on these examinations and on his work in the laboratories and conferences. The students will receive no letter or numerical grade, but will simply be passed for promotion or not.

At the beginning of the year, each student is assigned to and meets regularly with a faculty member who acts as his counselor for the entire year, for the purpose of offering help and guidance in any of the problems, academic or otherwise, which may arise in the course of the student's work in the first year.

The work of the entire year is equivalent to a total of 36 semester hours of credit.

RESEARCH

This is in keeping with modern trends of medical education. At a recent Institute of Teaching Anatomy at Swampscott, Massachusetts, considerable time was devoted to the problems of integrating teaching for the benefit of the student's progress. The University of Kansas seems to be one of the few leaders in attacking this problem of integration. Within the space, time, and faculty limitations, a fairly workable plan has been evolved.

The life and spirit of a faculty are not only governed by the enthusiasm of doing a good job of teaching but by the quality and worth of research done by its members. The following is a brief listing of recent interests in the various areas of research.

Basic information has been obtained concerning the sensitiveness of tissues under the influence of various hormones, including the sex hormones as well as those from the thyroid and adrenal. Within the last few years eight men who have been trained in this work are now teaching in eight different medical schools.

Experiments have been conducted with rats in parabiosis to demonstrate that the peripheral nerves are responsible for the transport of tetanus toxin to

the central nervous system. It has been demonstrated that a nerve regenerates to a greater extent into the host rat which is in parabiosis with the donor rat.

Many enzymes and nucleic acids have been analyzed microchemically from various parts of the nervous system. This can be done with an amount as small as a single neuron. The quantitative difference can be chemically determined between a dorsal root cell and a ventral root cell, thus paving the way for understanding why the spirochete attacks the ganglion cell and the polio virus the ventral horn cell.

The relationship of the cerebrospinal fluid space with the other spaces of the body, especially the lymph, has been studied. One cc. of 25 per cent trypan blue injected into the pia-arachnoid space of the opossum disappears within one hour and is found in the spleen.

Internal radiation with radium has proved the megakaryocyte of bone marrow to be the precursor of the blood platelet. Radium deposited in bones of pregnant rats is removed by lactating hormone when the rats are suckling and leaves the mother by way of the milk for suckling rats.

Progress is also being made on the problem of the route taken by the polio virus from the gastrointestinal tract to the central nervous system. A fluorescent dye is available which attaches itself to the antibody of the polio antigen.

Much of the work is related to the study of the enzyme systems as they appear in the developing nervous system. Careful work definitely points the way that there are clear cut chemical patterns associated with the neuronal patterns as they appear in the maturing central nervous system.

Department of Biochemistry

The faculty of the Department of Biochemistry consists of four full-time men on the Lawrence campus and several members with joint appointments on the Kansas City campus.

Medical biochemistry is now taught in the freshman year as part of the whole year course in normal human biology, which includes participation by the Departments of Anatomy, Biochemistry, Physiology, and Psychiatry. Biochemical aspects are taught entirely during the spring semester except for less than two weeks spent on the biochemistry of components of living organisms. Biochemical and physiological aspects of the functioning human organism are taught as a single presentation. On the Lawrence campus, the department also teaches an undergraduate biochemistry course, a year's course in general biochemistry for graduate students, and advanced graduate

courses in enzyme chemistry, proteins, nucleic acids, and biochemical preparations. Six Ph.D. degrees have been completed in this department since the first one in 1953.

Research under way in Lawrence includes programs on plasma protein fractionation, enzyme chemistry, pyrimidine metabolism, methyl group and sulfur metabolism, bacterial metabolism, and virus structure and biosynthesis. Research space includes three graduate laboratories on the second floor of Haworth Hall and two new 750-square foot laboratories built just east of the lower part of Haworth Hall. The new laboratories are for plasma protein fractionation and for work on the metabolism of pathogenic organisms, respectively. Special research equipment includes a large electrophoresis apparatus, a Spinco Model E analytical ultracentrifuge, and automatic radioactive tracer counting equipment.

Future plans include mainly an attempt to keep going in the present inadequate building until suitable new quarters are available.

Department of Medicine

Growth and change in the Department of Medicine in the past five years have moved at so rapid a pace that I have not felt previously that a "leveling" point had been reached sufficient to warrant an appraisal and a report. However, by July 1956, our immediate objectives will be done; therefore, for the first time, it is not premature and anticipatory to describe the Department of Medicine's program and developments.

The physical plant additions and alterations have been apparent to each of you, as you have visited the campus. I know that between your visits here, it seemed that a new wing or building would appear overnight. To those of us working on the campus, the physical growth has been spectacular, too. However, the excitement has been tempered by the associated problems of floor plans, equipment, allocation of space and minutiae, such as color schemes, etc. On occasion it has been difficult to recall whether we were interior decorators or physicians.

Getting the physical plant and activating it has been an initial objective for the Department of Medicine; however, this has been done with a certain basic goal or philosophy in mind. The basic philosophy, upon which the growth has been predicated, can be set down in a few lines:

1. To develop as the nucleus of the department a core of general internists. This group of men would be based at the Medical Center with offices and hospital services under their direction. These men

would carry the major portion of the medical students' curriculum in internal medicine. Physicians would be selected who understood that their chief responsibility was to demonstrate the daily practice of medicine *by precept*.

2. To develop around this core of general internists all of the essential specialties of internal medicine. These sections would carry a lesser role in the medical students' curriculum, but would be the essential strength of residency, fellowship, and postgraduate teaching.

3. To combine the above men into a smooth-working team which would give the students instruction by *precept* in the methods and morals of the practice of medicine. No attempt would be made to give a "course" in internal medicine, but the method would be essentially one of presenting a group of men practicing medicine as well as they know how, in near-ideal surroundings. Our goal was to instill in the students an awareness of the science of medicine, and equally, the art. And then to help them sustain their desire for knowledge after graduation, we planned:

4. To strongly support postgraduate efforts for the practicing physician. Each man joining the group would join, not only as a teacher at the undergraduate campus, but with an equal responsibility to the men already in practice.

5. To support research areas within the department and to obtain for these areas mature, talented men who could be virtually free of the demands of the practice of medicine. Efforts would be made to obtain adequate funds to give them freedom from the personal harassments of fund-raising and to give each investigator complete charge of his own investigation.

6. To develop with the general internists, the specialists, the investigators, and the physical plant a residency and fellowship program in internal medicine which would be outstanding; to make this residency program the essential administrative framework of the department with the realization that the strength and spirit of the department would depend to a large measure upon the quality of residents we could attract.

These have been the broad objectives, and this report outlines the accomplishments along this route.

Physical Plant. At the University we now have 124 beds for internal medicine and 42 beds for tuberculosis. In addition we have 25 rooms for research, one floor for out-patient facilities, adequate office space, and special clinical areas in several of the specialties. To strengthen the available bed-patient material, we also administer and staff 218 beds for internal medi-

cine at the Kansas City (Missouri) Veterans Administration Hospital.

Personnel. The full-time physicians, located at the center and Kansas City Veterans Administration Hospital, are 24 in number and divide their chief activities into the following general categories: general medicine, which is subdivided into four sections; the specialties, which are subdivided into cardiovascular disease, chest disease, gastroenterology, hematology, metabolic disease, neurology, and rheumatology and arthritis; and research, which includes the sections of experimental medicine; atherosclerosis research; enzyme chemistry of the heart, and steroid chemistry. All of these sections share, in various appropriate ways, responsibilities for the out-patient clinic, postgraduate teaching, residency and fellowship programs, and investigative work.

In this report I will not attempt to list the tangibles of accomplishment such as numbers of patients seen, autopsy percentage, papers published, etc. Perhaps next year, with the present report as a background, such information will be of interest.

Certain intangible activities could be discussed at length: the junior internal medicine curriculum based on daily patient-care rounds, the senior curriculum based on supervised office practice of medicine, the instruction time given by men practicing in the community, the Friday senior out-patient clinic instruction administered by the Academy of General Practice, the monthly visits as lecturers by internists from out in the state of Kansas, the affiliation with Osawatomie State Hospital, the technique of oral and written examinations sponsored by the department, the administration of sophomore physical diagnosis by members of the department, the numerous conferences and teaching clinics sponsored by the department (the Hixon Hour, Wednesday Grand Rounds, Monday Staff Meeting, Post Mortem Register, C.P.C., Chest Conference, etc.), the grants and endowments obtained, the scope of the residency program, the fields of research, etc. Each of these items could be a separate report.

For the future, we hope to keep to the same basic philosophy. To strengthen the program, we intend to develop a metabolic ward, an infectious disease ward (with an isolation unit), and a neurology ward. The success of such plans is to a great extent dependent upon the section chiefs in these areas. Other specialties of internal medicine have been purposely neglected while developing those which seemed essential. In the near future these additional specialties will be considered. Extension of the residency program to other hospitals will probably occur, also.

The five years this author has spent in Kansas have been a stimulating, exciting, fruitful, maturing, and fatiguing experience.

Department of Medical Microbiology

In the past year the activities of this Department of Microbiology, the youngest department in the School of Medicine, have been the culmination of development that began physically in 1952 with the completion of the Medical Science Building. "Microbiology" seemed preferable as a title since "Bacteriology" was considered too limiting a designation even in the time of Louis Pasteur who originally preferred the term "microbiology." Teaching, research, and development and service indicate opportunities and obligations in a three-pronged attack.

The teaching program for students in the School of Medicine was the first concern of the department. Emphasis is placed on indoctrination and maturation of the student so that he will be soundly equipped to grasp the developments five years hence; at that time, as a young doctor under the pressure of practice or advanced training, he must cope with advice which is handsomely presented and sometimes highly commercial. He must become truly able to request individualized aids, to evaluate the evidence, make up his own mind, or seek appropriate consultation.

The responsibility for teaching microbiology to medical students was assumed by this department after the retirement of Professor Noble P. Sherwood. The goal of the department has been to present a science, basic to the understanding of infectious diseases and reactive states, with stress upon principles that are especially applicable to the human end of the comparative spectrum. The several areas of bacteriology, immunology, mycology, parasitology, and virology, along with the immunochemistry applicable to each, are cohesively presented. The logical etiologic approach frequently involves one or more fields when infectious disease affects the patient and confronts the student of medicine, first in school and later in practice. Teaching has been correlated with other basic medical sciences of the second year, especially with pathology and pharmacology, in a curriculum which was purposefully organized to impart a grasp of the fundamentals of disease processes.

Medical Microbiology 271 is geared especially for medical students in the second year and is a prerequisite for other courses in the graduate school. It starts with a broad orientation over the entire field and produces a common experience for students and potential instructors (graduate and medical student colleagues). Since no premedical requirements in bacteriology now remain and most of the regular students are completely uninitiated, some initial emphasis

must be upon ecology and vocabulary. For medical students who have a master's degree in bacteriology or a related field, there has been encouragement and opportunity to carry out special projects, as their time permits. Some of them serve as teaching or research assistants. By now, a fairly even pace of lectures and laboratory experience has been set for second year students based upon accumulated experience and student response over the three years since the new facilities were opened.

Graduate education toward advanced degrees is making excellent progress in a program approved for candidates for both the M.A. and Ph.D. degrees. Six students are progressing nicely in various stages of courses and investigative work (one now is writing a thesis). These advanced studies are available to individuals with a bachelor's degree, and the prerequisites are the same as for entrance to the school of medicine. Medical students, technologists, and research assistants, as well as regular and independent graduate students, may enroll. Eligible doctors in postgraduate medicine are welcome to take courses or participate in the program, with progress to candidacy and achievement of the degree being dependent upon fulfillment of requirements.

Instruction for students in the training course for medical technologists includes 45 regular lectures and demonstrations. These students may enroll in Medical Technology 70 and 71 for university credit toward a bachelor's degree. One day of the annual three-day continuation study for medical technology is devoted to microbiology.

To accomplish tasks and achieve these goals, a diversified staff was required, and such a full faculty has been diligently occupied in fulfilling these responsibilities. A competent and well motivated faculty develop mutual stimulation with inquisitive and purposeful students.

Facilities for laboratory and office space are concentrated on the fourth floor of the Medical Science Building where heightened activities have led to sharing of all space for research and development, class preparations, graduate teaching, and service in special procedures.

The activities of the staff may be divided according to their responsibilities in (a) teaching, (b) research and development, and (c) service. Furthermore, there is subdivision into sections, viz. bacteriology, immunology and immunochemistry, mycology, parasitology, and virology. Each section is headed by a senior staff man in accordance with his primary interest, motivation and background; all are men with advanced graduate degrees. The chairman, who is a doctor of medicine, serves on the integrated curriculum committee for teaching second year medical students and organizes and is moderator of the weekly

integrated seminars for the same group in the first quarter. Each group of 24 second year students has an assigned faculty advisor throughout the year. This advisor is a doctor of philosophy with whom each student has an opportunity for close contact in the laboratory, individualized instruction, and conferences. Many students follow this close association throughout the clinical years and into the period of postgraduate medical education.

In teaching, host-parasite relationship is emphasized in the orientation period which precedes indoctrination in immunology and the more detailed study of special agents. The role of the host and the microorganism is studied as a matter of principle, and the students become acquainted with viruses as well as bacteria, fungi, and parasites early in the initial period of orientation. The lectures are divided among various members of the staff, and certain organisms are used to illustrate and emphasize mechanisms by which microorganisms can cause disease.

Correlation of information concerning infectious diseases is accomplished by ward rounds and conferences which are moderated by an associate in medicine and microbiology; he is also responsible for an elective course (290) designed particularly for medical students in the third year and for postgraduate medical education. Problems of infectious disease, as they apply daily to local community health, and emphasis on the communicability of microorganisms, are brought into the program by the city-county health director, who participates in lectures to the second year class, in conferences and in seminars as associate clinical professor of microbiology and medicine.

Section on Bacteriology: This is the chief area of the chairman who directs attention to problems of host-parasite relationship, streptococci and streptococcal infections, particularly as applied to rheumatic disease and to the prevention of rheumatic fever. These problems are considered as appropriate models for emphasis upon fundamentals related to the human end of the comparative spectrum in clinical research. In the development of what appears to be a new era in preventive medicine, the family doctor is assuming an important role in the prevention of cardiac disease. Tuberculosis is another disease which is emphasized; it follows immediately after the introduction to immunology and hypersensitivity. In the presentation of antibiotics, the microbiologic aspects are stressed, and there is a close association in this area with the Department of Pharmacology.

The immunology and immunochemistry section in association with clinicians is responsible for lectures and the laboratory in teaching of medical students and the correlation of fundamentals of hypersensi-

tivity as applied to the study of allergy in medicine and pediatrics. Immunohematology also is stressed. Each year the course in principles of immunology and immunochemistry (315) is presented to graduate students.

The head of the sections on mycology and parasitology was permitted to accept a fellowship provided by the China Medical Board which allowed him to study tropical medicine in the Central American countries through the summer of 1955. Material from this sojourn has been valuable to classroom teaching and in talks for professional and lay groups.

The section in mycology works in close association with the local, midwest unit of the Communicable Center, U.S.P.H.S., and with the infectious disease section in which there is interdepartmental cooperation with the Department of Medicine. A special lectureship in mycology was presented for students by Norman Conant, Ph.D., who was guest professor in this department during the week in which he was guest speaker in the Department of Postgraduate Education.

The section in parasitology presents its material to medical students in close collaboration with public health and audio-visual education, especially from the standpoint of preventive medicine and tropical disease. A course in Parasitic Protozoa (305) has been presented to graduate students.

The virology section, in addition to the instruction of medical students, presents a course in Viral and Rickettsial Infections (314) for graduate credit.

Those in research and development have been especially active in the following areas of endeavor: The role of heparin and tissue mast cells in proliferation of mesenchymal tissue as related to skin, synovial, and cardiac tissue is being investigated with the support of a contract with the Office of Naval Research. This work includes application of tissue culture and has been in cooperation with the chief of the section of plastic surgery. Two publications have come from this investigation which have dealt with its application to formation of keloids. Parallel efforts have been brought to bear upon the problem of collagen diseases, especially as related to pathogenesis of rheumatic fever, rheumatoid arthritis, and lupus erythematosus. Study of means for the prevention of streptococcal infection and control of rheumatic fever and rheumatic heart disease has been in collaboration with the Children's Convalescent Center; it has been made possible by the sustained assistance of medical and graduate students. At the Children's Convalescent Center a study of siblings in the search for control of rheumatic fever through preventive programs was initiated by this department with the support of local heart associations and with microbiologic laboratory participation made possible through an Office of Naval

Research contract, grants from the National Heart Institute, USPHS, and a pharmaceutical firm. One publication has appeared from these collaborative efforts and three have been accepted for publication.

A battery of tests has been developed to evaluate activity of reactive states with special reference to collagen diseases and keloid formation. This has been applied to clinical investigation and to study of animals, especially dogs and swine, with reference to protein-bound polysaccharides, C-reactive protein, Weltmann reaction, antistreptolysin O titers, and status of heparin by cold precipitate and heparin tolerance. A preliminary report has been published concerning this program. The comparative study of reactions in dogs and swine with those in man has been supported by a grant from the National Heart Institute and through the cooperation of the Department of Surgery in operative procedures on the animals. This is also in collaboration with the cardiovascular and experimental medicine sections in the Department of Medicine.

Medical students have shown initiative in various phases of the programs since the outset, and some of these men are now in postgraduate medical training. One student presented the preliminary paper on "Importance of Studying Siblings" at a national bacteriologists' meeting.

Particular progress is being made in studies by paper electrophoresis on protein-bound polysaccharides and proteins associated with the battery of other tests for collagen diseases. The effort of graduate students has been largely instrumental in developing and applying paper electrophoresis to this research.

One staff member who is research bacteriologist at the Veterans Administration Hospital, Kansas City, directs research in tuberculosis which is concerned especially with the effect of certain dietary lipids and protein intake on experimental tuberculosis. From these studies a publication has appeared during the past year after presentation at a national meeting. Work has been going ahead on rapid slide culture for primary isolation of *M. tuberculosis* in collaboration with other groups, and it has been accepted for publication also. Investigations are being made into the prediction of sensitivity of *M. tuberculosis* as it is associated with enzymatic activities.

Responsibility here at the Medical Center for bacterial physiology and metabolic activities of bacteria is now assigned to a single staff member whose research activities are coordinated with members of the surgical staff in a project designed to test the relative efficacy of combinations of drugs for pre-operative intestinal antisepsis. This project is supported by a grant from a pharmaceutical company and is administered by the Department of Surgery. Other personal and

special interests in this field are concerned with relationship of bacteria to surface active agents and other chemical agents with antimicrobial properties.

The head of the virology section is also chairman of the Research Committee of the University of Kansas Medical Center and has devoted continuous attention to fundamental aspects of the transplantability of tissues in collaboration with the Surgery Department and the section on immunochemistry. Six publications have resulted from this work and several students have participated in it. In 1955 a student working in this section won the Haden medal for the outstanding piece of research by a medical student and another placed second; this medal was also won by these same students in 1953. They likewise won an award from the Kansas Division of the American Cancer Society, for outstanding research in the field of "growth of normal and neoplastic tissues." The principal investigator and his colleagues won the same award for post-doctorate research in 1953 and 1954.

The main features of the above research have been concerned with effects of x-irradiation, splenectomy, injection of skin extracts, and the transplantation of multiple grafts on the skin in mice. The influence of genetic factors on the growth of homografted skin in inbred strains of mice and the role of proteolytic enzymes in the rejection mechanism of homografted skin are being studied with the support of the U. S. Public Health Service.

During the past year the American Cancer Society has sponsored a project concerning the importance of humoral factors on the transplantability of homologous tissues. At present a study is being made on the changes in electrophoretic patterns of serum proteins in homografted (skin) mice, guinea pigs, and rabbits. Also the agar diffusion method is being applied to a search for antibodies which may arise in these animals.

A project searching for methods to stimulate the growth of specific viruses in foreign hosts, especially chick embryos, has been sponsored by another pharmaceutical company during the last three years. Some of this work (on swine influenza virus) was presented at a national meeting. Specialized tissue culture techniques are also utilized in this project.

Medical students have been advised on sponsored projects as follows: (A) work on resistance of bacteria to antibiotics; (B) work on antigenic analysis of human malignancies; (C) growth of malignancies in irradiated heterologous hosts.

The areas of parasitology and virology are cooperating in research sponsored by the National Science Foundation. This investigation is concerned with the spread of GDVII virus within the host, the presence

of viral inhibitory substance in feces, and the relationship between viruses and protozoa or helminths. Antibiotic substances produced by molds also are being studied.

Research activities in the section on immunochemistry are centered upon studies on the effects of whole-body ionizing radiation on the hypersensitive state. Collaborators include Noble P. Sherwood, M.D., Ph.D., emeritus professor of bacteriology, and colleagues as well as some members of the Department of Radiology. Two students are also working on the project along with two research and laboratory assistants.

This section is also associated in a study of the immunologic aspects of skin transplantation as indicated above and in the development of techniques for sterilization and lyophilization of aortic grafts. Studies on hypersensitivity to human pituitary extract, as well as clinical and laboratory studies of patients with recurrent infections, are carried out in association with allergists on the staff of the School of Medicine.

Service rendered by the members of this department has been related to activities in the clinical bacteriology laboratory and to the training of students in medical technology in special diagnostic procedures within the departmental laboratories; here they are associated with preparation of material for instruction in class as well as research and development. Members of the staff have service responsibilities which correspond to the respective areas of teaching and research. Lectures and demonstrations are geared to diagnostic aspects. These diagnostic services, along with adequate consultation, are available to students at all levels, interns, residents, staff men associated with the Medical Center, and physicians who submit material through the mail or bring it in. Reference material is made available to doctors of the state in the fields of mycotic and parasitic diseases upon request.

Each of the staff has participated in programs of postgraduate medicine and continuation study, including the circuit courses. Speaking engagements associated with various phases of activity have been part of the service provided by members of the department. Under the auspices of the Kaw Valley Heart Association, 12 talks have been scheduled pertaining to problems of rheumatic fever, rheumatic heart disease, and preventive measures. Lectures on poliomyelitis have been presented to lay groups.

This report is respectfully submitted in appreciation of the support of the profession and the people who have presented these opportunities and for whom these responsibilities have been brought to fulfillment.

Department of Obstetrics and Gynecology

The triple function of teaching, patient care, and research in a clinical department has been, in the Department of Obstetrics and Gynecology, largely fulfilled in teaching and patient care in the past several years. Only recently has it been possible to develop a research program.

With the opening of the "D" and "F" building, this department has, for the first time, a modern hospital set-up. Always before it has been housed in various "temporary" sections of the hospital buildings. There are now 45 obstetric and 28 gynecologic beds with a thoroughly modern delivery room suite where it is possible to do cesarean sections at any time of the day or night without the delays incident to setting up the surgery suite. The out-patient section is immediately adjacent to the in-patient floor and has a total of some 14,000 visits annually. Five mornings per week are devoted to obstetrics and five afternoons to gynecology. The fourth year students are taught in these clinics at the same time they are in attendance on the hospitalized patients.

It is now possible to conduct a great deal of the teaching on the basis of "one teacher, one patient, and one student." It has been the policy in this department to change teaching methods by evolution rather than revolution. There are still a few lecture sessions (32 hours) for the second year class to introduce them to the basic anatomic, physiologic, and pathologic fundamentals in this clinical field. This is followed, in the third year, by a series of case analyses in the field. Particularly instructive past and present case histories are detailed and discussed. Each student is then ready to intelligently approach the patients he will see in his clerkship as a fourth year student. One half the class remains at the Medical Center for this practical teaching and the other half goes to the Kansas City (Missouri) General Hospital, where a staff of 12 clinical teachers conducts the teaching program. A coordinator from the Medical Center spends half his time in either place. The final oral examinations are conducted by a team of teachers from both staffs and can, thus, examine the teachers as well as the students.

The department is deeply grateful to the staff of the General Hospital who, with the part time teachers at the Medical Center, serve enthusiastically and efficiently without salary. A good teaching program without heavy expense is difficult to obtain.

This department was one of the first to become deeply interested in the postgraduate refresher and circuit course program for practitioners. The three-day refresher course, given annually, has now developed to the stage that guest speakers from various

parts of the country are not only willing but anxious to come here to participate in the program. The steadily increasing enrollment of men from Kansas and other states (one from New York, several from Texas, and one from Washington this past year) gives assurance of the appreciation of these teaching ventures.

The residency training program continues to be popular. It is being gradually increased in duration from the basic three years to about four years. Preference is given to Kansas residents, but men are also appointed from elsewhere; some of these men will subsequently locate in Kansas. Of the four men finishing this training this past year, three located in Kansas, in Wichita, Hutchinson, and Manhattan. The fourth went back to his home town, Lincoln, Nebraska.

The research effort, supported by donations of the full time staff to the Department Developmental Fund, and by grants in aid from federal agencies, drug manufacturers, and the Midwest Research Institute, has grown apace in the last few years. Four technicians and one microbiologist are currently employed. Study continues in the physiology and pathology of labor; mineral metabolism in pregnancy; pregnancy tests and testing; uterine motility; the chemical and metabolic basis of genital infection; the endocrinology of cancer and other gynecologic entities, and an extensive study of the relative merits of the protein bound iodine and the basal metabolic rate as indicators of thyroid function both in the pregnant and nonpregnant patient.

For more than a year there has been in operation an affiliation with the Osawatomie State Hospital whereby each resident spends six months on full time and is assisted two days per week by one of our full-time staff. This has afforded additional clinical material for the residents and improved care for the inmates of this hospital. While it has involved considerable sacrifice for the full-time staff of the Medical Center, it is believed to be an eminently worthwhile project. At the behest of Dr. G. W. Jackson, this program has been recently enlarged to include the Beloit Home for Girls and the Larned State Hospital.

Teaching, both undergraduate and postgraduate, is our first consideration. Proper care of a sufficient volume of patients is essential to the teaching program. Research will be conducted so far as personnel and financial support will permit. Service to physicians and residents of the state is also a prime objective.

Department of Ophthalmology

The Department of Ophthalmology has an active staff of 15 members, all of whom are certified by the

American Board of Ophthalmology. Four of the staff members are half-time and the others devote one to three mornings a week to the operation of the Eye Out-Patient Department and surgery.

The Eye Out-Patient Department operates a general clinic on Monday, Wednesday, and Friday mornings. This is for the care of indigent patients. Except in the case of emergencies, appointments are to be made for all clinic patients. Insofar as possible private patients are not seen at the Eye Out-Patient Department. They are asked to make appointments with physicians directly so that they will be seen in private offices away from the Medical Center. This arrangement is desirable in order to allow staff members to devote all their time at the hospital to the training of students and residents as well as the care of clinic patients.

All new clinic patients are seen in the General Eye Clinic on Monday, Wednesday, or Friday morning and are then referred to the special clinics if necessary. The special clinics are: Field Clinic Monday afternoon, Refraction Clinic Tuesday and Thursday afternoon, and Glaucoma Clinic Thursday morning. Eye surgery is performed on Tuesday, Thursday, and Saturday mornings. Both private and clinic surgery is performed on those mornings. All clinical surgery is under the direct supervision of the attending staff. No patient is operated upon unless the resident is assisted by a staff member.

The Department of Ophthalmology has a section devoted to ophthalmic pathology which is operated in cooperation with the Department of Surgical Pathology. It is interested in processing all the eyes which can be obtained. Reports and slides of all eyes studied are returned to the referring physicians.

In order to increase the collection of teaching slides, the Department of Ophthalmology will photograph all external and fundus lesions on private or clinic patients at no cost to the physician or patient. A copy of the slide will be sent to the referring physician. Fundus and external photographs are taken on Monday, Wednesday, and Friday mornings by appointment.

A weekly Eye Clinicopathological Conference is held in the Eye Out-Patient Department at 8:30 A.M. During the months of September, October, and November the conferences are on Monday mornings; December, January, and February, Wednesday mornings; and March, April, and May, Friday mornings. These conferences are open to all physicians who wish to attend, and both private and clinic patients are seen.

The residency program is being changed to a three-year period starting in July, 1956, because of the change in requirements by the American Board of Ophthalmology. After July, 1956, there will be three residents in training at the Medical Center. Prior to

the house staff training there is a requirement of at least three months basic science in ophthalmology.

The Department of Ophthalmology at present is interested in two clinical research programs, one on the diagnosis and treatment of uveitis and the second on diagnosis and treatment of retinal separation.

Department of Otorhinolaryngology

This department contributes to the teaching program in three areas. At the undergraduate level 12 lectures are delivered to the third year medical students, and during the academic months the fourth year students attend the out-patient clinic and operating room activities in groups of six. Thirty didactic lectures are given to the fourth year students in groups of 30. The program is completed by small seminars and daily rounds.

The postgraduate program for house officers consists of the instruction of five residents who are in service the year around. Four remain at the university and one at the affiliate institution, the Kansas City General Hospital. Eight visiting otolaryngologists participate in an approved three-year residency instruction program. Basic sciences are taught along with the clinical experience but are supplemented by formal instruction periods in pathology, embryology, physiology, and anatomy. In the early spring of each year, in conjunction with the Department of Ophthalmology, a five-day postgraduate course is offered to general practitioners as well as specialists. An effort is made to give this program an appeal to both groups. During the last four days in June a postgraduate course in anatomy and surgery of the temporal bone is attended by specialists in otology. Enrollment is limited to seven applicants.

A 32-hour course is presented to graduates of the School of Hearing and Speech each autumn and embraces the anatomical and physiological principles involved in the hearing and speech mechanisms.

Each resident physician is encouraged to engage in and complete a research problem during his tour of training. The following areas have been investigated by this department or in cooperation with other departments: the role of adenosem in the control of post adenotonsillectomy hemorrhage; the effect of neural collar; speech reception by bone conduction; surgical management of stricture of the external auditory canal; observations on the labyrinthine fluids of the dog, and rauwolfia in the treatment of atrophic rhinitis. Under investigation at present are these additional problems: the significance of recruitment in presbycusis; the effect of dehydration and hyperhydration on the auditory acuity of the cat; the

prophylaxis and treatment of lye stricture; the effect of irradiation on lymphoid tissue, and a new method of adenoidectomy.

The out-patient clinic functions every week day afternoon, but private patients are seen only by appointment and must be referred by another physician.

Department of Pathology and Oncology

With the completion of the Medical Sciences Building in 1952, the former Departments of Pathology and Oncology were combined into one department with excellent facilities for teaching, research, and pathology service. The full-time senior staff of 17 pathologists and research scientists is assisted in its activities by 12 part-time pathologists, 16 residents and fellows, and approximately 50 other staff members, including research assistants, secretaries, and non-professional assistants. There are 40,000 square feet of floor space devoted to departmental activities.

The teaching activities of this department are concerned with participation in a new experimental correlated teaching program with other departments in the second year, cooperation with the clinical departments in teaching practical applications of pathology in the third and fourth years, pathology courses for nurses, physical therapists, and occupational therapists, participating in the training of medical technicians, postgraduate courses in subjects such as medical-legal pathology and exfoliative cytological diagnosis, and pathology training for residents and other physicians desiring to meet their requirements for specialization in pathology and other disciplines.

Most of the departments concerned with teaching in the second year at the medical school participated in the development of an exciting experiment in medical education which is drawing increasing national and international interest. An attempt has been made to correlate the teaching of the related subject matter from different departments by juxtaposition of their teaching in order to assist the student in his own integration of the subjects as they relate to human disease. Integrated seminars are held each week to illustrate the clinical applications of basic science information taught during the second year.

Much of the teaching of pathology is done in discussion groups of 12 students and one instructor, and the emphasis in teaching pathology has been shifted to consideration of all aspects of the disease processes as they relate to the individual patient. Some experiments with animals have been introduced into the course in an attempt to illustrate the dynamic concepts of disease processes. The increase in teach-

ing staff in pathology has permitted wider participation by pathologists in the conference teaching of the clinical services in the third and fourth years. In each of the last two years, 20 to 30 medical students have worked in the Department of Pathology as students assistants or student fellows in connection with the teaching, research, and service functions of the department. Their close association with individual staff members in such work has been an important supplemental teaching mechanism.

The number of positions for residents and fellows in the Department of Pathology and Oncology has been increased to 16, utilizing the training facilities at the Medical Center and the Veterans Administration Hospital. In recent years two trainees have been supported in the department by the National Cancer Institute and one clinical fellow by the American Cancer Society.

The cancer teaching program at the Medical School is carried on by each of the various departments concerned with the subject of cancer. The Department of Pathology and Oncology has liaison staff representation with the important clinical services connected with cancer teaching. They participate with other members of the Medical Center staff in weekly tumor conferences, reports of which are published every other month in the JOURNAL OF THE KANSAS MEDICAL SOCIETY. The cancer teaching activities of the department are assisted by grants from the National Cancer Institute and the Kansas Division of the American Cancer Society.

The principal service functions of the department are related to the autopsy service, surgical pathology, cytologic diagnosis, and tumor registry and follow-up service. The number of autopsies performed each year has remained approximately 450. The number of specimens for surgical and cytologic diagnosis has increased to approximately 8,700 per year. This increase is explained on the basis of the increase in operative surgery within the institution, the fact that all specimens from the operating room are now given surgical pathology numbers regardless of whether they are examined microscopically, and the increasing utilization of exfoliative cytology as a diagnostic aid.

The tumor registry and follow-up service collects information now on IBM cards on all patients with cancer admitted to the hospital or clinic. Regular follow-up facilities provide up-to-date information on the course of these patients. At present 7,000 cases are included in this registry. Because of the good cooperation of physicians and patients within the past five years, less than three per cent of the cases have been lost from this follow-up service. This registry and follow-up service has been recommended as a model by the American College of Surgeons and

copied by other institutions in the country. Copies of the annual report of the tumor registry and follow-up service may be obtained on request. In recent years the tumor registry and follow-up service has been supported by the Kansas Division of the American Cancer Society. With the aid of a grant from the National Cancer Institute, the department has been preparing 12 sets of pathology material on tumor cases which are being distributed to pathologists in this four state area.

The Department of Pathology and Oncology has one of the largest active research programs of academic pathology departments. Productive research has been completed or undertaken in the fields of histochemistry, ultraviolet cytochemistry, biochemistry, protein and physical chemistry, sero-diagnostic testing, electron microscopy, audioradiography, radioactive tracers and pathologic physiology, endocrinology, tissue culture, microbiology, cancer biology, exfoliative cytologic diagnosis, and cancer statistics. Although much of this research is related to the structural, chemical, and physical changes in normal and neoplastic tissue constituents, there has been an increasing development of research in other areas. The results of these research activities are continuing to be presented at national and international meetings and published in scientific periodicals. In the absence of support of research relating to the pathology of human diseases by the Kansas legislature, this research has been made possible by the donations and bequests from private citizens and grants from the Kansas Division and national organization of the American Cancer Society, the National Institutes of Health, the Atomic Energy Commission, and the Damon Runyon Memorial Fund for Cancer Research. Six research fellows have been supported by the National Institutes of Health, the American Cancer Society, the Damon Runyon Memorial Fund for Cancer Research, and the American Heart Association.

Although the members of the department recognize that our first responsibilities are in the area of teaching, service, and research at the Medical Center, we also feel an obligation to participate in the betterment of our discipline. Members of the staff continue to serve as consultants to various state agencies and organizations, to national organizations of pathologists, and to national groups such as the U. S. Public Health Service, the Atomic Energy Commission, and the American Cancer Society.

Department of Pediatrics

The Department of Pediatrics believes that *learning* is more important than teaching, both for professors and students. Those of us who are designated as professors are concerned with providing the best

possible learning opportunities for students, house staff, and ourselves. The following paragraphs describe briefly the physical plant wherein some of our learning opportunities are located, the kind of learning opportunities that have been developed in this department, and some of the tangible results therefrom.

Physical Plant. The Department of Pediatrics has its headquarters in the Children's Pavilion, built in 1936, which is attached to the main hospital at the University of Kansas Medical Center. There are 73 beds for children in the pavilion; through affiliation with the General Hospital and the Children's Mercy Hospital of Kansas City, Missouri, there are another 30 and 120 beds, respectively, for children. There are 40 bassinets at K.U.M.C. and 20 at General Hospital assigned to pediatrics. All three hospitals run large out-patient services for children, totaling some 35,000 to 40,000 visits a year. These facilities are adequate for the present number of students. Any increase in students or decrease in facilities would seriously restrict the program of the Department of Pediatrics.

Medical Service to Patients. Children are admitted to the Pediatric Service at K.U.M.C. up to the 15th birthday. This age, however, is not rigidly adhered to. The final decision is based on the maturity of the individual. Infants and children can be and are admitted to the Pediatric Service without regard to complaint, race, creed, social or economic status. The Pediatric Service is cognizant of the importance of dealing with children as children and not just as problems in this or that disease. Consequently it makes every effort not only to create a friendly attitude toward children and their parents but also to administer to all their needs, not just those for which they might have come. Particular attention is paid to the adjustment that children make to hospitalization and the adjustment of parents to their sick child and his problems.

Medical Students. Junior students are assigned to this department, one-third of the class at a time for about 11 weeks each. Half of each group are assigned to Children's Mercy Hospital and General Hospital, the other half to K.U.M.C. There is no rotation of students among the three hospitals. The program for the students is approximately the same regardless of their hospital assignment.

During their 11 weeks on pediatrics at the Medical Center, medical students work on the wards and in the clinics and nurseries, taking histories and examining patients. Besides the general pediatric clinic, they work in the special clinics, such as well-baby, allergy, cardiology, and child psychiatry. The students are assigned patients in rotation on wards and in clinics and do simple laboratory procedures on their

hospital patients. Their histories, physical examinations, and knowledge of their patients are checked by the staff.

The students are part of the Pediatric Service while they are clerks and attend daily ward rounds with the staff and all staff meetings, including conferences held jointly with the Departments of Roentgenology, Surgery, Pathology, and Obstetrics; in the latter all stillbirths and neonatal deaths are covered. In addition, they attend, along with the rest of the staff, the weekly staff conference covering medical problems in pediatrics, the weekly conference conducted by the child psychiatrists, and weekly sessions held at the Children's Convalescent Center. In addition, each senior staff member holds seminars for the student clerks on pediatrics in the field of his specialty. These last one hour a day throughout the week until the subject matter has been covered and include the following: growth and development, infectious diseases, cardiology, child psychiatry, nutrition and metabolism, allergy, communicable disease and public health, newborn, accident prevention, hemolytic disease of newborn, renal disease, school health.

Certain goals are set for the student while he is on the Pediatric Service. It is hoped that he will: (1) learn how to recognize the highest quality of pediatric practice; (2) learn that parents of sick children are almost always disturbed people during the child's illness; (3) begin to learn how to evaluate information obtained from parents; (4) learn that there are other things in a child's environment besides viruses and lack of calories, vitamins, and minerals that produce ill health; (5) acquire as much factual information about the health problems of children as he is capable, but above all, learn *how* to obtain information from various sources that can help him in his study of health and disease.

Medical students are assigned in groups of three or four to one of the full-time staff during their 11 weeks on the Pediatric Service, in order that the student may go to some one person to secure help with any particular problem and in order that the staff may gain more first-hand knowledge of the progress being made by each student. Evaluation of the student's progress is made from day to day by those with whom he comes in contact. At the end of the 11 weeks an oral examination is given. There is rarely a significant discrepancy between the results of the oral examination and the day-by-day evaluation.

Research Activities. Research is a vital part of the learning process, albeit a special type of learning, because those doing it are hoping to extend the frontiers of knowledge. Many things can be described as research. The following paragraphs list some of the research activities going on in this department.

The laboratory unit for research in viral diseases

was established in 1946. From a modest beginning in a single room with space to house 20 monkeys, and with the assistance of a single technician, the unit at the present time occupies the entire fourth floor of the Hixon Laboratory. At work within the unit are 24 individuals; there are three physicians, a geneticist, a veterinarian, a secretary, 10 research assistants, and eight laboratory assistants. The animal space, occupying approximately one-third of the fifth floor of the laboratory, has facilities to care for 132 monkeys and several hundred small animals. In addition, there are well-equipped rooms for washing and preparing glassware for inoculating, and for performing postmortem examinations of infected animals.

From its beginning the laboratory has depended for fully 90 per cent of its research support from grants-in-aid from private and government sources. The total amount received in grants-in-aid during the past nine years is somewhat more than \$750,000. The salaries for personnel necessary to the conduct of the research and in support of several young pediatricians associated in research and in clinical pediatrics have come from these sources. Likewise, the salaries in support of research assistants have come largely from those funds obtained outside the university. Large expenditures have been made for basic equipment necessary for the extension of the research effort. The laboratory is well equipped for extended research in the field of virology.

One of the major interests of the laboratory has been poliomyelitis. The laboratory has been engaged in a cooperative effort with three associated laboratories in delineating the three known immunologic types of poliomyelitis viruses. In 1951 the laboratory was asked to prepare a large amount (20 liters) of standard antisera against the three known types of poliomyelitis viruses. With the completion of this project the sera were stored at the University of Kansas. Since then, portions of it have been sent to laboratories located in many parts of the world. These sera were an essential reagent in the laboratory phase of the 1954 poliomyelitis vaccine field trials.

When these projects were finished, the laboratory began a study to find strains of poliomyelitis viruses which were modified in their pathogenicity for human beings. The plan was to feed the attenuated viruses to human beings in an effort to provide enduring immunity. At the beginning these studies were interrupted by the vaccine field trials. For the ensuing 18 months our technical facilities were engaged in studying the antibody response of more than 11,000 children participating in the program. During the course of the evaluation study this laboratory served as liaison between the other 27 partici-

pating laboratories and the Poliomyelitis Evaluation Center under the direction of Dr. Thomas Francis at the University of Michigan. During this period also several studies on the development and persistence of antibodies in clinical cases of poliomyelitis were carried out. At present, studies are being conducted in (a) the movements of poliomyelitis virus in the body milieu, (b) the ways whereby virulence can be taken away from poliomyelitis virus.

Dr. Daniel C. Darrow, Children's Mercy Hospital professor of pediatrics, has been here for little more than a year. During that time he has begun two projects whose solution will contribute to our understanding of nutrition in children. One of them is technically difficult and consists in measuring the specific gravity of infants and children. This has been done in adults but not in children or infants. Once this has been accomplished, it will be possible to measure the amount of fat and other non-fat tissue in the child's body. The other project deals with iron-deficiency anemia, of which there is a large amount in this area, some of it serious. Both of these projects are fully supported by grants-in-aid from private and federal sources.

A member of the pediatrics staff who also serves as medical director of the Children's Convalescent Center has carried forward a large study on the prevention of rheumatic fever among children in the center who have had at least one previous attack. To date he has accumulated 3,000 patient-months of study, using long-acting parenteral penicillin without a recurrence. This project is also supported by private research funds.

Studies on neonatal respiration have been going on here for the past five years and are continuing. Several projects are now under way concerning (1) the effect of hypoxia on somatic and respiratory activity of the newborn, (2) measurements of minute and tidal volume according to respiratory rate, (3) weight loss in relation to respiratory rate.

All residents are encouraged to undertake research projects if they so desire. One resident house officer has been particularly interested in the differential diagnosis of jaundice in infants and has reviewed our experience here with atresia of the bile ducts and obtained some interesting and helpful findings. Another is working on a problem in the newborn as outlined above. Two have combined their efforts to investigate methods for prevention of crises in sickle-cell anemia.

The activities described above may seem to some like an over-extension of purpose for a single department. If so, then one should consider the alternative, which would be to reduce activity. A reduction in activity could be accomplished by (1) a reduction in personnel or (2) by requesting the present personnel

to change their interests. A simple reduction in personnel would necessitate reverting to lecture-type teaching. The lecture system is better than nothing, but it is far inferior to the present program in pediatrics, in which the student and professor meet at the patient's bedside. The second alternative, asking the present personnel to change their interests from learning, including research, to simply teaching, is untenable, as it would destroy the basic philosophy by which the department lives and operates.

Department of Pharmacology

The staff of the department has recently been enlarged and consists of six full-time and five part-time members. The major formal teaching activities of the department consist of a course in the second year of the medical curriculum, best described as dealing with the pharmacological basis of therapeutics, and a conference course in clinical pharmacology in the fourth year.

The second year course involves 68 hours of didactic instruction, 40 hours of laboratory, and 20 hours of discussion in small conference groups. Drugs used in the chemotherapy of infectious disease are considered at a time which permits close integration with related material in microbiology. The remainder of the course is concerned with drugs used in the therapeutic management of non-infectious disease.

Geographical and temporal separation prevents integration of this latter part of pharmacology with material taught by the Departments of Physiology and Biochemistry. As an alternative, it is presented late in the second year to provide temporal integration with introductory clinical subjects. In the course every attempt is made to present the proper clinical uses and the hazards of drugs as a logical development from existing knowledge concerning their pharmacological action at all levels of biological organization, their mechanism of action, and their disposition by the mammalian host. Laboratory experiments are designed to illustrate the actions of drugs and their mechanism. The teaching laboratory has been re-equipped and its facilities modified to permit execution of experiments by the students themselves, rather than by the staff as demonstrations. Results of experiments are presented by the students and are discussed and related to didactic work in informal conferences where each instructor works with a relatively small group of students.

Weekly, multi-disciplinary, integrated seminars of the second year curriculum provide an additional opportunity for presentation of pharmacological material as it relates to various medical problems.

Conferences are conducted in clinical pharmacology which involve one-eighth of the fourth year class

at one time. These deal with the use of drugs in individual clinical situations and place emphasis upon proper selection of drugs, drug preparations, and dosage in prescription writing.

The Department of Pharmacology also participates in those teaching programs of the Department of Postgraduate Medical Education which are concerned with or include discussions of drugs used in therapeutic management of disease situations.

A program of graduate training leading to the degree of Doctor of Philosophy in Pharmacology has been organized with the graduate school. The program is open to qualified college graduates and to physicians who desire an academic career with pharmacology as a major field of interest. Advanced courses in pharmacology are being formulated for this program in which several graduate fellowships are available, and in which the conduct of an original laboratory investigation is a prime requirement.

A major research interest of the department is in the relatively new area of chemical and biochemical pharmacology, which deals with the mechanism of action and behavior of drugs at the level of cellular metabolism, and with the basic cellular mechanisms responsible for the dissipation of drug action through metabolic alteration and excretion. These basic approaches are currently being applied in three research programs dealing with the cellular mechanism of renal tubular transport of drugs and metabolites, particularly organic bases and monosaccharides.

Since the renal tubular cell serves as a relatively accessible model, information derived from such studies should contribute not only to existing knowledge concerning mechanisms of renal tubular excretion and reabsorption, but also concerning mechanisms whereby drugs are transported across other cells, to sites where they exert beneficial or harmful pharmacological effects. Extension of the approach to other drugs and other physiological processes is contemplated.

Physical modification of research laboratories, including construction of a refrigerated laboratory for use in preparing tissue fractions and enzyme preparations, has been completed. These and a re-equipment program are designed to provide optimal conditions for research in chemical and biochemical pharmacology and for the training of graduate students in this area of investigation.

Department of Physical Medicine

General Organization. The Department of Physical Medicine is composed of the following sections: medical, physical therapy, occupational therapy, and

an educational section responsible for the training of student physical therapists and student occupational therapists.

The *Medical Section* consists of a director, assistant director, and two instructors in physical medicine. Their responsibilities include the direction and supervision of all treatment carried out in the department, the care of the in-patients assigned to the Physical Medicine Service, consultative service to the other clinical departments, and active participation in the teaching program of physical and occupational therapists, the nursing department, and medical students, and participation in the postgraduate medical education program for the training of resident physicians in the specialty of physical medicine and rehabilitation.

The *Physical Therapy Section*, under the direction of a chief occupational therapist and five staff therapists, provides a service facility in the areas of general medicine and surgery, physical disabilities, pediatrics, tuberculosis, psychiatry, and cerebral palsy.

The *training course in physical therapy* is conducted on both the Lawrence and Kansas City campuses. Two courses are offered: one, a four-year course leading to the degree Bachelor of Science in Physical Therapy, and the other a 12-month course leading to a Certificate of Physical Therapy. Pre-professional training is given on the Lawrence campus and professional training on the Kansas City campus. Affiliation is maintained with several hospitals in the Kansas City area and with the local Veterans Administration Hospitals where adequate facilities are provided for clinical training under careful supervision.

The *training program for occupational therapists* is also carried out jointly by the Lawrence and Kansas City campuses. Administratively, the five-year course is conducted by the School of Fine Arts of the University of Kansas and leads to the degree Bachelor of Arts. One semester of the training program for occupational therapists is carried out on the Kansas City campus. Extensive opportunities are available at various training centers over the United States for affiliate training in tuberculosis, psychiatry, physical disabilities, general medicine, surgery, and pediatrics. The occupational therapy section of the Medical Center is approved for affiliate training in several of these areas.

The *In-Patient Service* of the department has seven beds. Patients who present problems primarily of rehabilitation are candidates for treatment on this service. A limited out-patient facility exists for the purpose of providing a treatment service to patients who are seen in the out-patient clinic of the Medical Center as well as the treatment of occasional patients as a convenience to physicians in private practice who

do not have facilities for treatment enjoyed by this department. In connection with out-patient activities, there is active participation in the Cerebral Palsy Clinic from evaluation as well as treatment aspects.

SPECIFIC AIMS AND PURPOSES OF THE DEPARTMENT

Medical. Each of the physicians on the staff of this department has received special training in this medical discipline. The director and assistant director are diplomates of the American Board of Physical Medicine and Rehabilitation. The purpose of medical direction of the department is to provide other staff physicians with as much aid in the management of their cases as possible, also to provide a more direct and continuous supervision of the treatment procedures carried out. The Physical Medicine In-Patient Service provides an excellent training medium for the nursing and practical nurse programs in that much of the care of those individuals afflicted with chronic disease and disability must necessarily devolve to these individuals.

The correlation of medical and physical management of such patients is another important part of the training of medical students and resident physicians for future responsibilities. The integration of the physical problems with those which necessarily arise at the community and social levels after the individual has been dismissed from the hospital constitutes a real challenge for the development of this neglected phase of medical practice.

Research activities of this section have been directed into several channels: the effect of ultrasound on the threshold of perception of vibratory stimuli, the effect of ultrasound on reaction time to a standard neuromuscular stimulus, the effect of ultrasound on the electrical resistance of skin, and the effect of ultrasound on the reflex response to painful stimuli; the development of strength as a learning process, the five-second exercise bout; the rehabilitation of the hemiplegic individual by procedures which can be employed in the home. All of these topics represent separate areas of investigation which are either in process at present or have been recently concluded.

The *physical therapy* section has treated a total of 1,081 patients who made 12,325 total visits during the past year.

To the *occupational therapy* section 702 patients have been referred this year with a total of 6,711 patient visits.

In the *educational section* two classes each of physical and occupational therapy students are enrolled during the academic year. An average of 15 students in each of the fields of physical therapy and occupational therapy is enrolled each semester. Even though this represents a fair number of students who

are being trained in these important ancillary fields, active recruitment efforts must necessarily continue as the need for properly trained individuals is far in excess of the current supply.

The *Residency Training Program* in physical medicine and rehabilitation is approved for a three-year training period by the Council on Medical Education and Hospitals of the American Medical Association and the American Board of Physical Medicine and Rehabilitation. This involves a training program of ascending responsibilities. A formal training course in the technical aspects of this field is given during the first year of training. Training in basic sciences is provided through affiliation with the Departments of Anatomy and Physiology. Training in other aspects of rehabilitation is available through affiliations with other special areas of training. Clinical training centers around the many patients seen in this department for diagnosis, evaluation, and treatment. Attendance and active participation in the many conferences and meetings conducted by other departments of the Medical Center are encouraged. It is hoped that a type of reciprocal training of physicians in the other specialty areas can be equally encouraged.

The number of physiatrists who can be trained adequately is necessarily limited; one physician in each of the three years of training will receive good training and a well rounded experience. The need for physiatrists in the many areas in which physical medicine and rehabilitation can function is acute, and the opportunities for physiatrists far exceed the supply.

FUTURE PLANS FOR THIS DEPARTMENT

Work will continue in the three primary areas of teaching, research, and service. Developments in teaching and research are limited only by the amount of time available. The extensive remodeling program now in progress will facilitate more efficient treatment under working circumstances which should be more pleasant to patients and personnel alike. It is hoped that additional facilities can be developed for the management of those individuals who have been stricken with catastrophic illness or physical disability, since the numbers of such individuals are increasing and the problem of chronic disease and disability is becoming more pressing.

A better program of rehabilitation can be realized by a closer affiliation with other special agencies and services and the development within the institution of a more practical means of the realization of the true meaning of rehabilitation—to restore or to give back. The greater the extent of the physical disability, the more difficult it is to provide for the needs of the patient by the usual medical procedures.

Our hopes are for the development at this center of a program for the more effective solution of re-

habilitation problems to the end that those individuals, currently being trained, will be able to develop additional programs, in whole or in part, in the communities in which patients reside. The development of such a pilot program is initially expensive, and additional funds must be sought if this aim is to be realized. These problems will not be resolved within the next year or next few years, but steady progress should result if this goal is kept in mind.

Department of Physiology

The activities of the Department of Physiology on the Lawrence campus are concerned with the teaching of first year medical students, of college students at all levels, and of graduate students in physiology and other areas. An active research program is progressing through the combined efforts of the six full-time staff members and the graduate students.

One of the faculty has recently received a three-year Lederle Medical Faculty Award, and another holds a Watkins Faculty Scholarship for the summer of 1956. In addition, two graduate students are on fellowship appointments; one is a Rockefeller Fellow from India, and another is a United States Public Health Service Pre-Doctoral Research Fellow.

All members of the department play a major role in participating, along with the Departments of Anatomy, Biochemistry, and Psychiatry, in teaching the first year of medicine. Freshman medical students are taught, in the first year, the structure and function of the normal human organism, not in a series of separate courses divided among the departments, but, insofar as possible, as a single full year's integrated program. Particularly close is the correlation between the structure and function of the nervous system and between the biochemical and physiological aspects of body function.

A variety of college level courses in physiology is taught in order to serve the needs of students in pharmacy, physical education, physical therapy, occupational therapy, and majors in other related departments, as well as those students who are interested in human physiology as part of a broad liberal education. In addition, the department participates, along with the Departments of Anatomy and Biochemistry, in an integrated course in the Foundations of Human Biology for third year nursing students.

A graduate training program is offered which leads to M.A. and Ph.D. degrees. Along with the more general graduate courses, there are available more specialized courses at the graduate level, such as the advanced physiology of the cardiovascular system, advanced neurophysiology, special physiology of the gastrointestinal tract, and physiology of the special senses.

The diversity of research interests among the staff members is illustrated by the nature of some of the current projects, including a study of the hemodynamics of the cardiovascular system and the effects of drugs upon them in the normal animal and in animals with experimentally produced atherosclerosis. This project is aimed at furthering basic understanding of cardiovascular function and studying dynamic changes produced by the progressively developing atherosclerotic process. Results indicate that characteristic changes in the function of the vascular system may be diagnostic in early stages of atherosclerosis.

Another area of study concerns the mechanisms of anaphylactic shock. This project involves a study of the release of heparin or heparin-like substances into the blood during shock, the similarities and differences between anaphylactic shock and histamine shock, and the role played by various plasma protein fractions in the sensitization of animals to whole blood plasma.

In neuromuscular physiology, two specific problems are the mechanism of action of anti-convulsant drugs and the control of activity of the tracheal musculature.

In the field of metabolism, the effects of various fatty acids upon carbohydrate metabolism and their pharmacological effects upon the central nervous system are being studied. In addition, plans are formulated for a future study of the effects of trypsin on bone metabolism and on calcareous secretion in general.

Two long-unsolved problems in physiology are being attacked. The first concerns detailed mechanisms involved in visual accommodation, and the second is a study of the mechanisms which control hunger and appetite.

One departmental member is particularly interested in the general field of biophysics with special emphasis on the application of electronics to biophysical research. He is at present working on the development of a method for electronically recording the instantaneous output from either ventricle of the heart. Such a method would make available information about cardiac output and its control which presently available methods do not afford.

Much of the progress in medical research today depends upon the use of biophysical methods and upon an understanding of the biophysical properties of the living organism. Biophysics as a field of endeavor is far less well-defined than is biochemistry; like biochemistry, however, it stems from and is closely related to physiology. Much of the research being done in the department at present is oriented along biophysical lines. It is planned to further extend the work of the department in this direction. There is no unanimity of opinion as to what con-

stitutes adequate training in biophysics, nor indeed as to the content and limits of this field. It is believed that a Department of Physiology can and should contribute strongly to the training of people interested in this area.

Department of Postgraduate Medical Education

OBJECTIVES AND NATURE OF THE PROGRAM

Medicine has become so complex that it is obviously not possible to present a completely detailed and sustaining knowledge concerning every medical and related discipline within a four-year period. In addition, new discoveries of value to the practicing clinician continually are being made. Consequently, the four-year medical course, internship, and even residency supplies merely the foundation for a life-long study of medicine. Such study, aimed at acquiring new knowledge and skills, as well as refreshing former ones, is postgraduate medical education.

Postgraduate instruction at the University of Kansas School of Medicine was at first directed largely to general physicians. Now, teaching is directed to physicians interested in general medicine and surgery as well as those interested in specialties and subspecialties, such as anesthesiology, cardiology, chest diseases, gastroenterology, hematology, obstetrics, etc.

Refresher courses, continuation courses, correspondence courses, and in-residence training are available. Refresher courses are one- to five-day courses, given at the Medical Center by the School of Medicine faculty and distinguished teachers from other medical schools. About 60 per cent of the instruction is by lecture and seminar; 40 per cent is given in ward walks, small discussion groups, live clinics, and actual laboratory experience. Each day of instruction comprises seven clock hours, making an average of 21 hours in session per course. All appropriate teaching methods are used, including the comparatively new audiovisual teaching aid—closed-circuit television. Refresher courses are offered also to such paramedical groups as medical technologists and nurses. Eighteen courses of this type were presented last year.

Continuation courses are those offered in sessions lasting one-half day to one day each week or each month over a period of time. Such a schedule makes it practical for physicians in active practice to attend without absenting themselves from their practice for several days. Continuation courses of the circuit type offer six hours of instruction at afternoon and evening sessions, one day each month, November through April, at centers throughout Kansas. The Kress Foundation grant has made it possible to expand the num-

ber of centers from eight in 1950-51 to eleven in 1954-55, thus reaching many doctors who had not been able to attend previously. The programs for each center are presented on the same day of the week each month. They are conducted by a team of three faculty members, including clinicians and basic science teachers. In addition to didactic instruction, there are clinicopathological conferences and live clinics.

For the past two years, correspondence study courses in basic and advanced electrocardiographic interpretation have been offered. They give the physician an opportunity for practice in the interpretation of electrocardiograms. More correspondence study courses in appropriate subjects are being developed. Possibly in some instances, such courses will either begin or conclude with a one-day session at the Medical Center in order to increase their usefulness.

In-residence training is offered by special arrangement with the chairman of the department concerned and with the Department of Postgraduate Medical Education. Physicians may spend varying periods of time, for example from one week to nine months, on the wards, in the laboratories, and in conferences and seminars in order to increase their competence in various aspects of medical practice. There has been an average of ten enrollments each of the past five years in this training.

*Summary of Activities—July 1, 1955 to
January 1, 1956*

Enrollment:	Doctors	1,059
	Nurses	286
	Lay Persons	292
	Total	1,637

Courses: There are 20 courses of the refresher type, three of the continuation type, three conferences and seminars, and four correspondence study courses scheduled for 1955-56. The six-months circuit course is being presented this year at 11 centers throughout Kansas.

Enrollment for refresher courses this year has shown a substantial increase. The internal medicine course recorded an increase of more than 100 per cent, when compared with registration last year. Enrollment has decreased somewhat in the six-months circuit course.

*Summary of Activities—July 1, 1954 to
June 30, 1955*

Enrollment:	Doctors In-State ..	1,042
	Out-of-State	894
	Technicians	157
	Nurses	310
	Lay Persons	515
	Total	2,918

Courses: There were 18 courses of the refresher type, three of the continuation type, five seminars and conferences, and three correspondence study courses; the six-months circuit course was offered at 11 centers throughout Kansas and Missouri. The schedule of courses included three that represent a new type of program or fields in which training had not been offered previously. These were: surgery—operative clinics, a full-day program offered one day each month for a term of four months; the pathology of crime, a two-day course for the medical profession and the law enforcement officer; and industrial and occupational medicine, a three-day course for the doctor in general practice and the industrial physician or surgeon. Four different programs were provided for the lay public during the 1954-55 year.

DEPARTMENT ORGANIZATION

The work of the Department of Postgraduate Medical Education at the University of Kansas School of Medicine is directed by Dr. Mahlon Delp, who is assisted by Dr. Jesse D. Rising. The full-time staff, charged with the responsibility of the promotion and administration of the program, includes an executive director, two field representatives, a secretary, and a registrar-bookkeeper.

CONSIDERATIONS FOR THE FUTURE

During three of the past four years, this department has had the largest enrollment of physicians in refresher, circuit, and continuation courses of any school in the United States and Canada. During the school year 1954-55, one physician enrollment in every nine in the 92 schools of North America was in the Postgraduate Department at the University of Kansas School of Medicine.

Assuming that the foundation has been laid for a sound and well-balanced program of postgraduate medical education, it is appropriate to give attention to: (1) an evaluation of the effectiveness of our present program, and (2) new teaching ventures and techniques.

EVALUATION OF PRESENT PROGRAM

A beginning has been made in the establishment of certain standards or a base line in regard to postgraduate medical education for physicians of the midwest region. One of the methods is a statistical report from each doctor in a given area. A statistical questionnaire has been used as one method of gathering needed information for doctors in general practice, in specialty practice, or in group practice. Plans are being made to evaluate each program offered by this department during the coming year.

NEW TEACHING VENTURES AND TECHNIQUES

General practice residencies throughout the country are in constant change due to the fact that few medical schools have a Department of General Practice. With the cooperation of the other departments of the University of Kansas School of Medicine, a realistic attempt can now be made to promote and foster a residency in general practice.

Numerous hospitals in this region are now qualified for internships if their programs are built upon a foundation of affiliation with an accredited teaching institution. We want to explore this area further.

The headquarters office for the American Academy of General Practice is located in Kansas City, Missouri. This office represents the heart of this large medical organization, a group which has had an effective influence in the promotion and growth of postgraduate medical education throughout the country. It is desirable that the department cooperate closely with this organization on any sound postgraduate program.

Educational programs in medicine for lay persons have been explored by this department in past years, and the need is great. The university has a definite obligation to foster such teaching.

Our programs to date have been arranged and presented to a regional group for the most part. An examination of registration statistics during the past two years shows an enrollment which has expanded to beyond what normally would be expected from a regional coverage. Departments within the structure of the medical school have such exceptional talents for teaching that it seems only logical to develop certain programs on a national basis. The Department of Pathology and Oncology, for example, has an exceptionally strong faculty capable of presenting a course in histochemistry. By so doing, this department can offer training in fundamental research which is difficult to secure in this country. Just such a program is being planned for June of 1956. A similar venture in cardiovascular disease could easily be carried out by the Department of Medicine.

In the past an occasional one-day symposium has met with good acceptance. This type of program is popular and, although expensive, should be expanded.

Innumerable requests for speakers have come from county medical societies to the administration and to the Department of Postgraduate Medical Education. These requests regularly come from Oklahoma, Kansas, Nebraska, Iowa, and Missouri. The organization of a speakers' bureau by this department seems necessary in order to more effectively carry out this function.

In recent years, it has become increasingly apparent that a medical school, if it is properly to fulfill its

obligations to the medical profession and to the public, must offer not only the basic four years of undergraduate medical training but must also accept responsibility for providing physicians with opportunities for high quality postgraduate education. The people of Kansas can take pride in their medical school for the manner in which it has accepted this responsibility and become a leader in the field of postgraduate medical education.

Department of Psychiatry

In 1948 the beginning of a modern psychiatric program at the University of Kansas was described in the *JOURNAL OF THE KANSAS MEDICAL SOCIETY*.^{*} Since then considerable progress has been made in some areas, although the program has lagged in others. Staff development and the undergraduate teaching of psychiatry have proceeded quite well. Beginning with only one full-time teacher of psychiatry in 1948, there have been added five full-time teaching positions for psychiatrists, plus two for psychologists and two for psychiatric social workers, all of whom participate in the teaching program. In addition, there are two part-time^{**} psychiatrists and 30 voluntary attending or consulting staff members.

Since July 1, 1953, when the division of neurology was separated from psychiatry to become a division of the Department of Medicine, the department has been designated simply as the Department of Psychiatry. Its clinical and teaching functions are now carried out through four sections, the In-patient Section, the Out-patient Section, the Psychosomatic Section, and the Child Psychiatry Section, each headed by a full-time faculty member. The growth of the teaching staff has been paralleled by an increase in the number of teaching hours and by improvement of the teaching in all four years of the undergraduate curriculum.

Development of the physical facilities of the department, of postgraduate training in psychiatry, and of research work has not kept pace with progress in other areas. Planning for a new building, to provide adequate facilities for the in-patient and out-patient care of psychiatric patients, has been under way since the 1949 session of the state legislature appropriated funds to be used, together with Hill-Burton funds,

^{*} Roth, W. F., Jr.: The Psychiatric Program of the University of Kansas Medical Center, *J. Kan. Med. Soc.* 49: 241-243, (June) 1948.

^{**} The term "part-time" designates a staff member whose principal office and work is not at the Medical Center but who devotes a considerable percentage (10 per cent or more) of his working time to the teaching program. The amount of time spent in teaching is the chief point of differentiation between a "part-time" and an "attending" staff member.

for the construction of such a building. Unavoidable delays have postponed the fruition of these plans. However, construction of the new building for psychiatry was finally started in September, 1954, and is nearing completion at this time. Its availability for use during the current year is regarded as a certainty. When it is in full operation it will provide facilities for the care of 40 additional bed patients (total of 65), for 30 to 40 "day hospital" patients, and for a much larger and more efficient out-patient service. Moreover, the additional space and modern facilities will greatly assist the teaching program and will make possible a satisfactory development of the postgraduate training program and research.

THE UNDERGRADUATE TEACHING PROGRAM

The general objective of the psychiatric curriculum is to teach psychiatric principles universally applicable to medical practice. Relatively little emphasis is placed upon the problems of psychiatry as a specialty. Some specific goals of the teaching program are to help the student learn:

1. The essential facts of normal personality development, structure, and function.
2. The basic principles of psychopathology, personality reactions to internal (somatic) and external (environmental) pathological or stress situations, and the various special types of psychopathologic reactions.

3. How to recognize a psychiatric problem when he sees it (even though the presenting feature may be an emotional reaction masquerading in a cloak of somatic symptomatology), and what to do about it, which requires familiarity with Item 4.

4. How to talk to a patient, to take a meaningful life history, and to appraise the present status of the patient's mental functioning, his personality assets and liabilities, his treatment needs, and his potentialities for response to therapeutic measures.

5. Some practical skills in simple, supportive psychotherapy; how to treat patients with emotional problems and anxiety-based symptoms, for whom this type of treatment is appropriate.

6. To know how he may and when he must utilize specialist personnel and community agency resources to assist him in dealing with the more complex and difficult diagnostic and treatment problems.

A summary outline of the undergraduate teaching by the Department of Psychiatry is given in Table I. This shows the total number of hours of psychiatric teaching in the regular, required course of the medical school. It indicates all teaching done by members of the Department of Psychiatry, both in time assigned specifically to the department and in courses and clerkships of other departments. In addition to the regular curriculum, there is a psychiatric film (movie) course of approximately 20 hours (open to all students in the second, third, and fourth years);

Table I. *Summary of Undergraduate Psychiatry Curriculum, Showing All Teaching Hours*

1st Year—Dept. of Psychiatry:	(a) Lectures	63		
	(b) Conferences	20	83	83
2nd Year—Dept. of Psychiatry:	(a) Lectures	15		
	(b) Group Discussions	15	30	
Physical Diagnosis:	(a) Lectures	2		
	(b) Clinical	10	12	
Integrated Seminars			2	44
3rd Year—Dept. of Psychiatry:	(a) Lectures	36		
	(b) Clinical ("clerkship")	36	72	
Dept. of Pediatrics:	(a) Lectures	10		
	(b) Clinical work with patients	26		
	(c) Case conferences and seminars	24	60	
Dept. of Medicine	Psychosomatic Rounds		12	144
4th Year—Dept. of Psychiatry:	(a) Treatment Seminars	16		
(Out-Patient Clinic)	(b) Clinical work with patients	24		
	(c) Diagnosis and Disposition seminars	20	60	60
Total Hours in Regular Curriculum, All Four Years			331	hours

and elective clerkships are offered in all of the sections of the department. Some details regarding the teaching in each of the four years are given in the following paragraphs:

First Year. A series of lectures throughout the "Integrated Freshman Year" course are given by members of the Department of Psychiatry. The lectures are supplemented by discussion periods, for which the class is subdivided into groups of 20 to 25 students, each led by an instructor. Normal personality development and structure, the anatomy and physiology of intellect and emotion, and the interrelationships of mind and body in the functioning of the several organ systems constitute the subject matter of this phase of the teaching in the first year.

Second Year. In the course on physical diagnosis two lectures are devoted to the subject of interviewing, while practical methods of dealing with patients are discussed and demonstrated in the "laboratory" sessions, in the out-patient clinic. A few weeks after the instruction in general pathology has gotten under way, and at about the time the course in physical diagnosis starts, weekly sessions of the course in psychopathology are begun. This course comprises 15 two-hour sessions, each consisting of a one-hour lecture to the entire class followed by a discussion period during which the class is divided into 10 equal groups, each meeting in a separate room with its own instructor. Building upon the foundation of the previous teaching concerning normal personality structure and function, the lectures describe the evolution of maladaptive mechanisms and the part played by environmental pathology in personality maladjustment. Special attention is given to life situations in infancy and childhood which produce or lay the groundwork for later frank psychopathology.

In the discussion groups, where each student has an opportunity to express his reactions to the material presented in the preceding lecture, there is free discussion and interchange of ideas. The student may learn that emotional experiences, which he previously had regarded as peculiar to himself, are commonly (if not universally) experienced by others. Such an experience appears to lessen emotional resistance to new (to the student) concepts of mental functioning and to allow the material of the lecture to become a usable part of the student's knowledge and experience. In other words, the discussion groups lead to a better understanding and assimilation of the subject matter, and to consequent increased ability to use it in clinical practice.

Third Year. Now that the student is fully embarked in clinical work, his psychiatric instruction is centered about the clinical material he sees in the course of his medical and pediatric clerkships as well as during the week he is assigned to the psychiatry

ward. During his time on the pediatrics service he is introduced to psychiatric problems commonly encountered among children. In the course of his medical clerkship he gets instruction in psychosomatic medicine. On the psychiatry ward he gets an overall view of the functioning of an intensive treatment unit and experience in taking psychiatric histories and in making psychiatric examinations. Throughout the year, at weekly lectures, the entire range of psychiatric problems encountered in practice is discussed, with case demonstrations when appropriate.

Fourth Year. During the quarter of the year when he is assigned to the Medicine Clinic the student spends three half-days per week in psychiatry. Here he interviews patients in the diagnostic clinic and also in the treatment clinic (on a different afternoon). He is assigned a selected patient for weekly therapeutic interviews, which he conducts throughout the quarter, with regular supervision by a staff psychiatrist. He attends a treatment seminar each week and also a case conference at which diagnosis and disposition recommendations are made on cases from the diagnostic clinic, which are presented by him or by members of his group. Through this experience in the out-patient clinic where he is given a considerable amount of responsibility for the handling of patients, the student has the opportunity of learning, under competent psychiatric supervision, how to use the doctor-patient relationship and how to treat, confidently and effectively, the minor psychiatric problems that he will encounter in his future practice.

POSTGRADUATE TRAINING IN PSYCHIATRY

In 1949, the residency training program of the Department of Psychiatry was first approved (for two years' training) by the American Medical Association's Council on Medical Education and Hospitals and the American Board of Psychiatry and Neurology. In 1951 the full three-year program was approved, preparing the resident for board certification. A wide variety of clinical services is available to the trainee, at the Medical Center, at the Kansas City Veterans Administration Hospital, and at other affiliated institutions.

Each resident's sequence of clinical services is planned to suit his individual interests and needs, in accordance with the type of psychiatric work that is his ultimate goal. However, the basic course includes a period of 12 to 15 months on the In-Patient Service, a three-month assignment on neurology, and assignments to the Out-Patient Section, the Child Psychiatry Section, and the Psychosomatic Section. If the resident is planning to enter the special field of child psychiatry, he may be assigned for a period to the

Child Study Unit (an affiliated institution for post-graduate training and research in child psychiatry, which is located at the Medical Center), or he may elect to take a fourth year of training there. In conjunction with the clinical training there are didactic courses and seminars, plus clinical and teaching conferences of other departments on various subjects in areas related to psychiatry (e.g., neuropathology).

In some respects, the progress and results of the residency training program have been gratifying. Starting from scratch during the post-war period, when teaching personnel was difficult to obtain, a residency program has been developed that affords its trainees a thorough and comprehensive training in psychiatry. Moreover, a small beginning has been made in meeting the critical need for trained psychiatrists in this area; four residents trained in the program have taken important clinical and teaching positions in the medical school and affiliated institutions. However, the number of physicians seeking residency training, particularly the number of native Kansans, is far too small. In relation to the great need for trained psychiatrists that exists in public and private institutions and in practice in communities throughout the state, the number of trainees is grossly inadequate. It is urgently requested that physicians of Kansas concern themselves with this problem and do all they can to interest native sons and daughters in the field of psychiatry and to encourage young colleagues to take advantage of opportunities for psychiatric training.

In addition to the regular three-year program for the training of psychiatrists, the department offers individualized postgraduate educational opportunities for physicians desirous of psychiatric instruction and supervised experience to improve their effectiveness in the practice of medicine. The *Bulletin of the Department of Postgraduate Medical Education* may be consulted for further information on this subject.

CLINICAL FACILITIES

Inasmuch as the psychiatric clinical facilities at the Medical Center have undergone some change in recent years and are due for a significant increase in the near future, it may be well to describe the facilities and medical services that are available. To simplify the description, adult and child psychiatric services will be discussed under each of these headings. Attention is called especially to the fact that the procedures for referring various categories of patients are necessarily quite different.

Adult In-Patient Service. The physical facility for the care of psychiatric in-patients is the Psychiatric Receiving Ward. As has been mentioned, this will soon be moved to a new psychiatric unit, on the main

campus of the Medical Center, connecting with other wards of the general hospital. The capacity of this new unit will be roughly three times that of the present facility, or more if the factors of increased operating efficiency and the added capacity of the "day hospital" are taken into consideration. The function of the day hospital will be to provide, through the daytime hours, all the treatment modalities available to bed patients. Patients who are convalescent and sufficiently recovered that they may be discharged from in-patient status may live outside the hospital and return to spend a certain number of days or parts of days per week within the hospital.

It is a policy of the service that all patients referred for admission should be seen by a member of the staff before actually being admitted. This results in a better relationship between patient and staff and usually facilitates subsequent treatment. Therefore, if in-patient care is unquestionably necessary or is thought to be probably indicated, the referral procedure begins with the setting up of a consultation appointment for the patient to be seen by a member of the staff. Requests for such consultation appointment or for any desired information regarding admission of patients should be addressed to Admissions Secretary, Psychiatric Ward. In cases where it is definitely known that private consultation and/or private patient hospital care by a particular staff member who accepts private patients is desired, the case may, of course, be referred in the usual manner to the psychiatrist in question.

Adult Out-Patient Facilities. The psychiatric Out-Patient Clinic offers diagnostic and consultation services for indigent patients. The patients are seen at the "screening" or diagnostic clinic, which meets two afternoons each week.

A large proportion of referrals to this clinic are from other clinics of the Out-Patient Department of the Medical Center, but direct referrals may be made by outside physicians. The capacity of the clinic is usually adequate to meet the needs, without the accumulation of a large waiting list, but the clinic necessarily operates on an appointment basis. Referrals to the clinic or requests for information should be addressed simply to the Psychiatric Out-Patient Clinic at the Medical Center. Facilities for out-patient psychiatric treatment, especially for cases requiring long-term individual psychotherapy, are, unfortunately, quite limited.

Selection of cases for the treatment clinic is handled by the screening clinic. While a certain number of minor psychiatric problems can be handled satisfactorily in the "student treatment clinic," where senior medical students carry cases under staff supervision, the treatment of more difficult psychiatric

problems in the clinic is carried out by psychiatric residents, treatment of selected cases under staff supervision being an important part of their training in psychotherapy. Thus, the capacity of the clinic to handle long-term treatment cases is closely linked to the size of the residency program. It is hoped and anticipated that this will increase as time goes on. There are also limited facilities for psychiatric diagnosis and treatment of private out-patients, since most of the members of the teaching staff have a certain amount of time for work of this sort.

Psychiatric Services for Children. There is, at present, no special psychiatric in-patient facility for children. However, children who are suitable for hospitalization on an open pediatric ward may be admitted for observation and treatment. Ample facilities are available for the out-patient examination and treatment of children presenting psychiatric problems. A Child Psychiatry Clinic functions as a unit of the general Pediatrics Out-Patient Clinic two mornings each week. All patients referred to the Child Psychiatry Clinic are first seen in the general Pediatric Clinic. Patients not eligible for clinic care may be referred by special arrangement to an attending psychiatrist.

The Child Study Unit. In addition to the above-described facilities an important treatment asset of the Medical Center is embodied in the Child Study Unit. Although affiliated, and cooperating, it functions as an independent organization or branch of the Medical Center. The Child Study Unit is primarily a research and training center for postgraduate training of workers in all disciplines involved in the psychiatric treatment of children. Although not organized for the purpose of providing clinical services, the Child Study Unit accepts selected out-patient cases for diagnostic study and treatment.

Department of Public Health And Preventive Medicine

Objectives of Instruction. The objectives of instruction in the Department of Public Health and Preventive Medicine, as offered in the entire course, may be summarized as follows:

1. To help bring to the student physician understanding and acceptance of the role of medicine in society and of the preventive concept in a broad sense as a guiding philosophy in medical practice. To encourage the student to live by the principle that his vocation as a physician above all else is that of service to his community and that preventive medicine is basic to complete fulfillment of his role as a true physician.

2. To teach health as well as disease in develop-

ing better understanding of human biology in terms of the reaction and adaptation of man to his physical, biological, and social environment as a frame of reference for the physician in dealing with individual and community problems.

Department of Radiology

The Department of Radiology has grown from the one room occupied 30 years ago in the basement of the Administration Building to our present quarters. When we moved upstairs in 1940 Dean Wahl remarked that we would "rattle around a bit." Since that time the floor space has been expanded, and waiting patients are still required to sit in the hall. The situation merely reflects the growth of the Medical Center over 30 years.

Three radiologists function in the department. There has been a systematic effort to divide the activities of the radiologists into: (1) administration and supervision of radium and x-ray therapy; (2) the isotope program, and (3) special procedure activity. The latter includes angiocardiographs, cerebral angiograms, bronchograms, myelograms, and the development of a research program. Routine diagnostic work including gastrointestinal study is divided among the three radiologists. Each individual is expected to assist, as the work load shifts, in that area where help is needed.

The department has a place for four residents in training in radiology. A well balanced training program with experience in all of the facets of the field of radiology is offered. An attempt is made to supervise closely the first two years of training. In the third year the resident is encouraged to make his own decisions with consultation available as requested.

The department accepts all work requested, and this work is done on the day that it is ordered. A backlog of work is not permitted to accumulate. The average work load is approximately 25 therapy cases per day and 95 diagnostic cases per day. The number of cases listed does not give the entire picture. One of these cases may be a simple x-ray of a hand while another may be a complicated laminograph or arteriogram, procedures requiring considerable time and special apparatus.

The teaching program in the medical school is not as elaborate as it is felt that the field of radiology merits. It is not at all as inclusive as was the program offered as recently as two years ago. The program consists largely of consultation periods with small groups of students. It is possible for the student to go through medical school without having had ac-

cess to some of the fundamental principles of radiology that many of the men now in practice learned while in medical school.

The teaching obligation also includes a few sessions with nurses. In this program the residents are encouraged to participate.

A two-year training program leading to the status of a registered x-ray technician has been developed. This program is largely one of practical experience in various activities of the x-ray department and is augmented by a series of lectures by an instructor and the physicians in the department.

The management of the university has been generous to the department in accepting recommendations for new and replacement equipment during the last few years. It is felt that the department is as well or even better equipped than is the radiological department of many medical schools. Plans are being formulated to increase the efficiency of the radiation therapy department. It is hoped that these plans may be completed within the next year.

True research including animal experimentation was an impossibility during the period prior to July 1, 1953, because of the work load and limited professional help. Any time spent in research would have deprived patients of adequate care by the department. It is the hope that now with three staff men available there will be time for this important aspect of radiology. Despite the work load, a rather elaborate follow-up record of all cancer cases treated in the department of radiology has been kept. From every three months to a year a personal letter goes to a patient who has received care in the department, suggesting that the patient return for a check-up examination. If that is not possible a note is requested relative to the patient's condition. Periodically over the years cases of special interest have been re-evaluated, summarized, and described in the literature. A constant effort is made to assess the value of any new method of treating cancer by radiation, and where justified the new method is adopted by the department.

ISOTOPE SECTION

The department of radiology first started using radioactive substances in May of 1950. At this time both radioactive iodine and radioactive phosphorus were made available. Since that time the use of radioactive material has steadily increased. This section of the radiology department functions in the same manner as the rest of the department. Requests for various isotope studies desired are initiated by the referring physician.

The greatest volume of work is in the use of radioactive iodine. Approximately 3,000 radioactive uptake determinations for thyroid gland function are

done per year. In the past year a tracer-scanner has been added to our armamentarium. This permits accurate mapping of the gland and actually makes it possible to draw an outline of the thyroid gland. This is of value in studying nodules in the neck, particularly those related to the thyroid gland. Approximately 300 of these studies are being done each year.

In addition to diagnostic work done with radioactive iodine, more and more patients are being treated with radioactive iodine for hyperthyroidism. One hundred fifty such patients were treated in the past year. Results have consistently been comparable to surgical results.

Radioactive phosphorus is used principally in treatment of polycythemia and leukemia. This work is done in conjunction with other forms of therapy. It seems to be an efficient method of delivering total body radiation. Approximately 75 patients are treated a year.

Radioactive gold is being used in the treatment of malignant effusions both in the chest and in the abdomen. This is a potent radio isotope and requires considerable care in its handling. The volume in this form of treatment is not comparable to those forms mentioned above. Approximately 40 patients have been treated with good results in 50 per cent of the cases.

The latest additions to the isotope sections have been the use of cobalt tagged Vitamin B 12 in a test for pernicious anemia. This procedure is just starting. Experience is therefore limited. However, reports on this test elsewhere are exceedingly encouraging; at the moment this appears to be an accurate and simple test.

Additional services are being contemplated for the near future; these include the determination of blood volume and red cell mass.

RESEARCH AND DEVELOPMENT

The x-ray therapy section has cooperated with the investigations of numerous members of other departments engaged in the study of effects of x-rays, by scheduling a regular period of time twice a week when the therapy machines are made available for experimental work. This system seems to be working satisfactorily and no separate equipment for x-ray therapy experiments is contemplated, at least for the immediate future.

The development of a plastic ruler for roentgenology has been progressing slowly due to efforts to synthesize design suggestions from the showing of the preliminary drawing last year. This ruler should be completed within the next few months and will have utility for anyone reading x-ray films, especially orthopedic surgeons.

The students for whom Dr. Youngstrom has served as advisor have been initiated into the techniques of clinical research. One has done a case study of the treatment of carcinoma of the urinary bladder, and another has investigated the range of size of the upper mediastinal shadow in newborn and young children. The project is planned as a preliminary to a study of what happens to children who have large upper mediastinal shadows. The study is necessary to evaluate recent work indicating that cancer of the thyroid is ten times more common in children who have had radiation to the thymus in infancy, than it is in the general population.

The study of the effects of ionizing radiation of the hypersensitive state is being investigated in collaboration with the Department of Microbiology. This project is progressing according to plan, and significant results have already been obtained which will be reported in the near future.

A grant has been requested from the U. S. Public Health Department to cover cost of equipment in the amount of \$10,016 for the investigation of "correlated speech studies of the pre- and postoperative cleft palate by use of a new rapid cine radiographic technique." This is a group endeavor with several departments participating. Action on the grant request is scheduled for March of 1956.

Plans are being formulated for a cooperative investigation of effects of x-ray on lymphoid tissue as it can be studied in dogs' tonsils.

An investigation of the pulmonary circulation in emphysema, pre- and postoperative, is in the planning stage in collaboration with members of the Departments of Surgery and Medicine. Some special equipment for rapid serial radiography of the chest must be developed.

Department of Surgery

The Department of Surgery has considered its primary purposes to be three in number: first, teaching at undergraduate, graduate and postgraduate levels; second, furthering medical knowledge through investigation in both experimental and clinical fields, and third, provision of medical service in its finest form. Each of these functions is totally dependent upon the other, and it is impossible for one to exist without the other. Each has been thought equally desirable, and comparable effort has been exerted in the pursuit of each of the purposes.

The following report indicates the present plan of operation and the activities of the department for the year 1954-1955.

It would be unrealistic to assume the year could pass without losses. The greatest of these for the

department was the death of Dr. Thomas G. Orr, Sr., who died unexpectedly November 19, 1955. Dr. Orr had served as the professor of surgery in this department for 25 years preceding his retirement to emeritus status. Dr. Orr held the esteem and affection of the great number of students and patients who had been under his guidance and care throughout the many years of his teaching career. His death represents an irreparable loss to the department.

A consideration of the primary purposes of the Department of Surgery places teaching as the first function. The Surgical Department participates in each of the four years of the medical school curriculum. The effort in the first and second years is limited to participation in integrated seminars, correlation courses, and instruction in physical diagnosis. This effort is a cooperative one with other clinical and basic science departments in the school.

The teaching opportunities in the third year curriculum become greatly increased. Each of the third year medical students is assigned for one-third of the year to the Surgical Department. During this period of time a closely organized teaching program is followed, covering the field of general surgery; no intense effort is directed toward the specialty fields of surgery during this year. Time is divided between scheduled seminars and discussions, ward rounds, operative room work, direct contact with all surgical patients, surgical pathology, and seminars. One-half of the assigned time is spent at the University of Kansas Medical Center and the other half of the assigned time is spent at the Kansas City Veterans Administration Hospital or at Menorah Hospital. The work at these affiliated institutions chronologically correlates with that given at the university.

No work is repeated throughout the trimester, and each student has access to instruction in all of the facets of general surgery. No time or effort is devoted toward the teaching or development of surgical technique, but emphasis is placed upon diagnosis, the early recognition of those diseases amenable to surgical treatment, the indications for surgical treatment, pre- and postoperative care, and what can be expected from surgical treatment. At the termination of the surgical trimester, oral and written examinations are given to each student. The written examination is of the type used by the National Board of Medical Examiners. This year, for the first time, the department used the actual examination which had been given by the National Board of Medical Examiners for examination of the medical student following the completion of his fourth year. Although this has been used for only one-third of the class at present, the chairman of the National Board of Medical Examiners termed the performance "very creditable." The estimate of the performance of the

student for the surgery course is based upon the work of the student throughout his period of clinical clerkship, by the instructors under whom he has had his direct assignments, and by marks achieved in the various examinations.

The fourth year student is assigned to the surgical service for one quarter of the year. During this year he rotates through the specialty surgical services and works in the general surgical out-patient department. Assignment to hospital patients for complete evaluation, operative room work and observation, and assigned seminars and discussions are used by each of the sections for teaching purposes. Final evaluation of the student is arrived at by the correlation of the estimate of each of his instructors and by final examination of the material covered by the specialty surgical sections as well as by general surgical examination. The rather rigid correlation of the work in the two years offers an unexcelled opportunity for carefully supervised instruction in general and specialty surgery in undergraduate training.

The graduate teaching program in surgery starts with the intern or first year following the completion of medical school work and continues through the residency program in general surgery or one of the surgical specialties.

Not infrequently a fourth-year medical student desires to plan a graduate program in surgery. If his decision is firm regarding entering surgery as his chosen field of medicine, he is generally advised to use the first year of graduate training to gain additional insight into fields of medicine other than surgery. The specialty board requirements are such that an adequate opportunity is afforded him in subsequent years to achieve fundamental knowledge in surgical fields. The first year of his graduate education can be more profitably spent gaining a fuller realization of the possibilities and limitations of other areas of medicine.

On the other hand, the fourth-year student who has not yet decided upon surgery as a choice for his field of medicine is urged to spend at least a portion of the first year of his graduate training program on the surgical services so that more insight may be gained into its functions, limitations, and possibilities. During the training of this year an increased responsibility is given the man by the direct application of factual information achieved through the undergraduate years, but no effort is directed toward teaching operative technic.

Following the first year of graduate training, general surgery and surgery specialties at the University of Kansas offer unexcelled opportunities for residency training. It is appropriate to describe in some detail the residency training program on the general

surgical service which, in large measure, is duplicated in each of the specialty training programs.

The general surgery program is closely integrated with that of the Veterans Administration Hospital in Kansas City and the Veterans Administration Hospital in Wichita. Residents are simultaneously chosen for the three institutions; the work of each complements and augments the entire training program. Six men are chosen for each of the first two years, four of whom will be carried through the third and fourth years of the general surgery training program if their work proves to be satisfactory. Two of the six men are chosen with the intent and understanding that they are receiving general surgery training in preparation for entrance into a specialty surgical field. Thus a total of 20 men are in the residency training program at the three institutions at any given time.

Each of the men who are receiving general surgery training in preparation for specialty surgery receives six months of specialty surgery training and 18 months of general surgery training during two years as a resident on the general surgery service. The general surgery resident spends six months of the first year in specialty surgery training and six months on general surgery services. During the second year he spends six months on a problem in the laboratory or in a clinical field, and it is the intent of the program that an original contribution to surgical literature be made by the resident during this time. The remaining six months of the second year are spent on private surgical services at the University of Kansas Medical Center.

During the third year nine months are spent in clinical surgery and three months in surgical pathology. The entire fourth year is spent in clinical surgery with senior resident responsibility. An increasing amount of responsibility is given to the resident throughout the entire program, and at the completion of the program he has developed the skill and judgment required for eligibility for American Board of Surgery examinations. It will be noted this represents a columnar system of surgical training as opposed to the pyramidal system. By the adoption of the columnar system it is possible to assure each man taken into the program that his training will be complete and that he will be retained as long as his work proves to be entirely satisfactory. Appointments are made on a yearly basis; in the event work is unsatisfactory or the desire and enthusiasm of the resident wane, the program can be discontinued.

With the increase in the number of people covered by medical insurance, adequate material for resident physician training in surgery is becoming increasingly scarce. The demand that each patient who has insurance coverage be regarded as a private patient

ACHROM

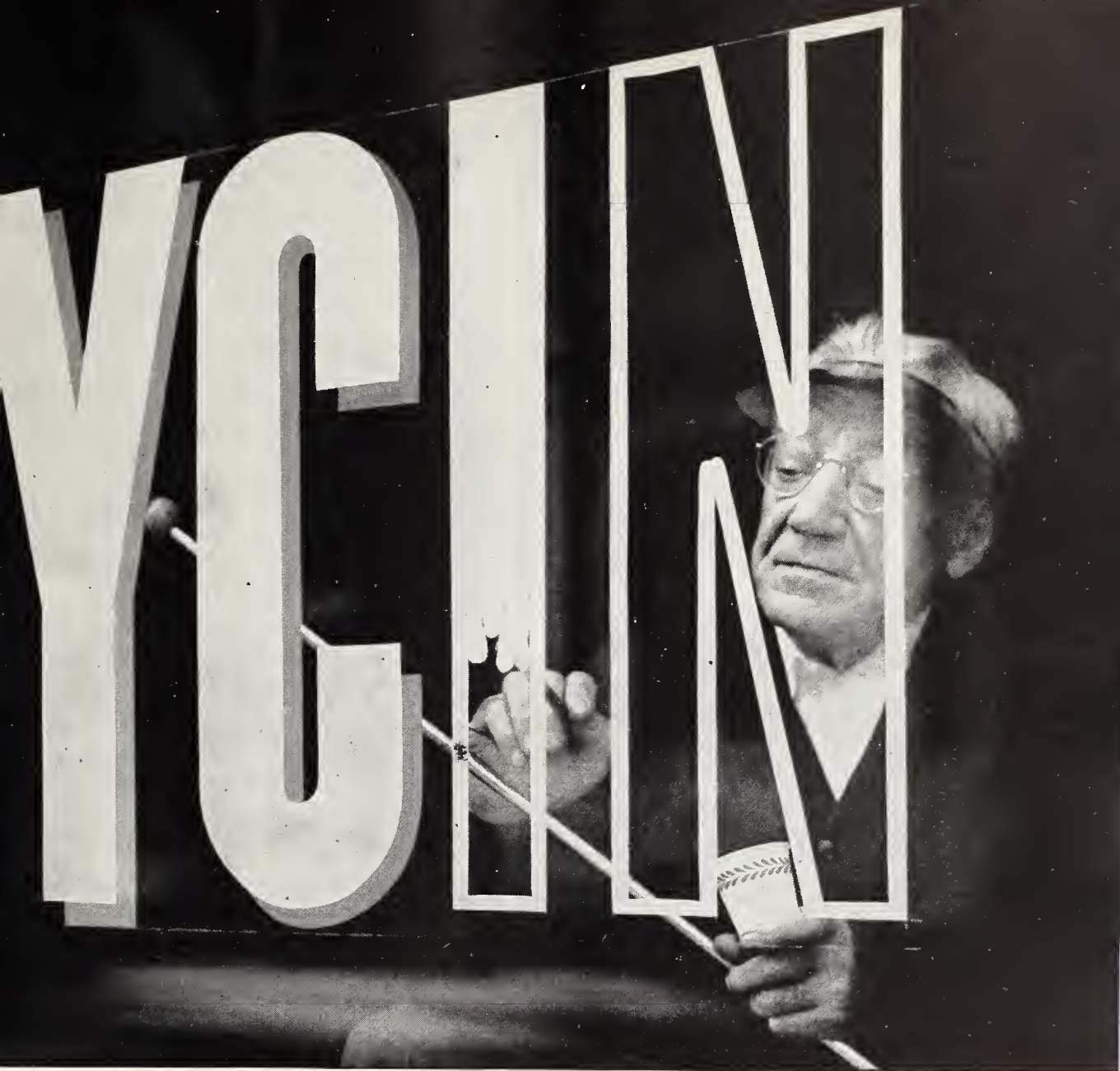
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of the staff physician is unrealistic from the standpoint of the best training of surgeons for future years. The University of Kansas is more fortunate in this regard than most institutions for, by comparison with private hospitals, our indigent patient load remains relatively high, and the affiliation with the two Veterans Administration hospitals provides excellent material for training purposes. Supervision of all work done is carefully controlled without interfering with the increasing responsibility delegated to the resident and the prerequisite for eligibility for examination by the American Board of Surgery.

The postgraduate teaching effort is centered in two formal courses in which all sections of the department participate. The first of these is the course in operative technique, held for one day at monthly intervals for four months. On each of these days a well recognized authority in surgery is invited to act as guest instructor. The operative sessions are televised. Appropriate slides, moving pictures, and other visual aids are used during periods of instruction.

The second formal program is the four-day postgraduate course in surgery which is held during the month of January. Nationally known faculty members are regularly invited to act as instructors during this course. The Kansas Division of the American Cancer Society makes it possible to devote one day of the course to the study of neoplastic disease by a contribution which in part defrays the expense of this day's instruction. The course is designed to give practical instruction in basic and fundamental concepts of surgery.

The increasing scope of the teaching function of the Department of Surgery each year places increasing demands upon the time of the surgical staff and indicates the necessity of increasing the personnel. This has been initiated by appointing surgeons in the locality who are interested in teaching in the out-patient clinic, and it is planned that such appointments be extended.

The second primary function of the Surgical Department is considered to be in the field of investigative work. Funds for this program are not available from the school budget at present, and it is necessary that support for this work come from contributions made by the surgical staff and by special grants from public and private sources. The most productive of these sources has been the surgical staff, whose contributions are incorporated in the Surgical Developmental Fund. A fixed percentage of the gross income of each member of the surgical staff is contributed to the fund, used for any purposes concerned with development of the department. This is felt to be fundamentally the support of investigative work for which other funds are not readily available.

A notable project of the developmental fund for the current year has been the establishment of two research laboratories. One of these is housed in the Medical Science Building and is equipped with the finest instruments and devices required for the more common laboratory determinations. The second laboratory is immediately adjacent to the operating room in an area formerly occupied by an observation gallery which had served no useful purpose. This laboratory is equipped primarily for obtaining objective evidence of changes occurring in patients during surgical operations.

The Surgical Biophysics Laboratory continues to be an active project of the Developmental Fund. In addition to supplying technical support to the Department of Audio Visual Education, facilities and personnel are available in a consultative capacity for the school. The laboratory has been of great assistance in providing solutions to the technical and engineering problems frequently arising in every research project.

There have been a number of investigative projects supported by the Surgical Developmental Fund during the current year. These include (1) study of pulmonary ventilation and lung compliance during surgical operations, (2) factors affecting the efficiency of ventilation during surgical operations, (3) study of the pathogenesis of esophagitis, (4) study of pyloric ganglion cells in hypertrophic pyloric stenosis, (5) development of a pumping mechanism for application in extra corporeal circulation, (6) development and fabrication of a unique apparatus for cardiac defibrillation, stimulation, and for the measurement of the electrical impedance of the heart in the surgical patient, (7) development of a method for enterodialysis for regulation of total body electrolytes, (8) development of a more satisfactory method for extra corporeal oxygenation of blood, and (9) studies on the mechanism of cardiac fibrillation and defibrillation under hypothermia in the experimental animals.

These various activities have represented a considerable monetary effort, but they have established the investigative program of the department on a sound footing. In addition to these studies a grant has been obtained from a pharmaceutical company for the study of materials used in the preparation of the bowel for surgical procedures. Funds have been obtained from the Public Health Service for studies in blood transfusion reactions and for studies on the repair of intracardiac septal defects. Additional funds from the United States Public Health Service and from other sources are being sought to further the investigative program of the department.

The Out-Patient Department of the Surgical Serv-

ices has continued to increase its activity. General surgery and specialty surgery conduct scheduled out-patient clinics which, in addition to being a useful service function, provide the finest source of material for clinical teaching. Clinic facilities are used for the follow-up of patients. This provides the best method of evaluation of surgical therapy and gives information upon which clinical reports may be based.

New patients seen in the surgical out-patient clinics numbered 3,218 in a total of 19,669 patient visits, which represents an increase of approximately 18 per cent over the preceding year.

The last fundamental effort of the Surgical Department is directed toward medical service. It is our firm conviction that this is inseparably related to the other efforts for, in reality, superior patient care is the final purpose of the functions previously considered. Here the medical student should see medical service at its best. This implies that there be no distinction between the quality of medical care offered the private patient or the indigent patient.

Clinical facilities for the surgical service are somewhat limited at present. A total of 182 beds is now allotted to the entire department. This is somewhat below the eventual capacity due to current reconstruction within the hospital building. During the year 3,276 patients were admitted to the department and 5,585 operations were completed.

GENERAL SURGERY SECTION

A deliberate effort has been made to avoid the splintering away of special sections from general surgery. This is in deference to the undergraduate and graduate teaching requirements established according to board concepts. Teaching and research interests of the section have already been indicated.

SECTION OF ANESTHESIOLOGY

Teaching by the anesthesiology section spans the third and fourth years of the medical school curriculum. Concomitant with assignment of clinical clerks to patients admitted to the hospital in these years, there is an assignment of a clinical clerk to assist and observe the administration of an anesthetic if a surgical operation is required. During the total period of student assignment to the surgical services, considerable experience is gained. In addition to clinical teaching, formal discussions and seminars are regularly scheduled.

The graduate level teaching is approved by the American Board of Anesthesiology, and at present eight resident physicians are being trained for board accreditation. The postgraduate course in anesthesiol-

ogy is the major project in teaching at the postgraduate level.

Laboratory research supported by United States Public Health Service funds has been concerned with determinations of the effect of anesthetic agents on coronary blood flow. The effects of several drugs of potential value in anesthesia are currently subject to clinical investigation.

SECTION OF NEUROLOGICAL SURGERY

This specialty section of the Department of Surgery is presently composed of two full-time members of the attending staff certified by the American Board of Neurological Surgery. They are assisted by three resident physicians in various stages of training in neurosurgery.

The interests of the section continue along three main lines: teaching at the student and graduate resident level, patient care, and investigation.

During the first year of medical training, in cooperation with the Department of Anatomy, students in neuroanatomy participate in a two-hour live patient conference designed to illustrate the clinical application of the principles of neuroanatomy. Fourth year students receive a series of ten lectures presenting factual material relating to clinical neurosurgery of importance to the physician in practice. During the fourth year, students are assigned to the section in groups of six for a 12-day period. During this time the students function as a part of the section, working up all patients in rotation and participating in floor care.

Opportunity for discussion is given during daily ward rounds, regularly scheduled conferences in neurosurgery, neuroradiology, and neuropathology, as well as through individual discussion with the resident and attending staff. All out-patients are similarly observed with attending or resident staff. In addition, conferences are held with each group emphasizing factual material relating to neurological surgery and of importance to the physician in general practice. In all of these student contacts, emphasis is placed on matters pertaining to diagnostic neurology, patient-physician relationship, and patient care, rather than technical aspects of neurological surgery.

At the resident level, the section offers a board-approved, three-year residency in neurological surgery. This program, still evolving, is designed to give a graded experience in applied basic science, diagnostic neurology, and operative neurosurgery. In addition to previously mentioned service activities, four weekly conferences at the exclusively resident level implement this postgraduate program. Clinical research has centered on the behavior and surgical

treatment of intracranial aneurysms. Research continues in methods applicable to the study of the intimate circulation of the brain. This involves better methods of observation and the development of quantitative methods for measurement of regional blood flow.

During the past year the service has enjoyed a better than 12 per cent growth in opportunity for patient care. The service is additionally responsible for neurosurgical care at the Kansas City, Missouri, Veterans Administration Hospital on a consulting basis. This has provided a welcome opportunity for extension of our training program.

ORTHOPEDIC SURGERY SECTION

Teaching of the undergraduate medical student remains the prime purpose of the orthopedic section. Instruction in orthopedic surgery spans the third and fourth year of medical school, but an intensive instruction period is delegated to the fourth year.

Fourth-year students are assigned to the orthopedic section for 12 days. During this time they see and work up all house patients, clinic patients, and emergency patients requiring orthopedic treatment. The students have daily ward rounds and lectures on fundamental orthopedic subjects. Grand rounds are held once a week. Fracture conferences and lectures are given to all students on the surgery services at weekly intervals throughout the academic year.

Current research projects concern bone growth following peripheral denervation and factors concerned in dislocation of the hip.

Graduate teaching efforts are primarily directed toward resident training though there is regular participation in postgraduate courses of the Surgical Department. The orthopedic residency program provides full qualification for examination by the board for certification.

PLASTIC SURGERY SECTION

Teaching activities of the service at the fourth-year student level include daily ward rounds, daily conference with the students, daily instruction in the operating room, wards, and clinic, plus attendance at numerous conferences. Students assigned to the Plastic Surgery Section are on duty in the emergency room at all times, one as first assistant to the house staff and one as second assistant. There is provision for three resident physician staff appointments which are approved by the American Board of Plastic Surgery. Residents are selected for a three-year training experience after two years in general surgery. Teaching at the house staff level consists of various daily impromptu case problem conferences on the wards and in the clinic, often illustrated by slide material and motion pictures. A motion picture relating to plastic surgery is shown every week.

Graduated responsibility is given the resident during his training experience. Resident travel, supported by the Padgett Fund, has been instituted. This permits the senior resident to complete his training program by a tour through the outstanding plastic surgery services in the country.

Research activities carried out during the year concerned further studies in keloid (hypertrophied scar) production. This was done in the Earl Padgett Memorial Laboratory, a laboratory founded by funds left by Dr. Padgett and equipped and maintained by additional funds from other sources going to the same endowment fund.

UROLOGY SURGERY SECTION

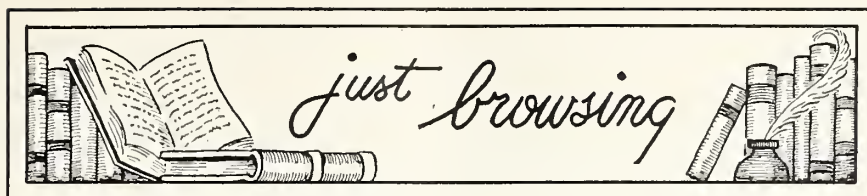
The Section of Urology is composed of the University of Kansas Medical Center Service and the Urology Service at the Kansas City, Missouri, Veterans Administration Hospital.

The Section of Urology participates in the undergraduate teaching program for a short but intensive ten-day period during the student's fourth year. The entire day is spent with the staff in the out-patient department, on the hospital wards, and in the operating areas. Obviously, only a few special technics can be taught, and emphasis is placed on diagnosis and basic fundamentals of urology.

The training of the graduate student at the resident physician level has assumed increasing importance. This obligation has become more important in medical centers because of the steady decrease in training facilities in other hospitals. During the past ten years the number of urology residents has increased in this section from an occasional one to a total of six men at present. After internship each man has two or three years of general surgery training and then three years in urologic surgery. Residents spend equal time on the University of Kansas Medical Center service and on the Veterans Administration service.

A Urology Research Laboratory has been maintained at the Medical Center by generous gifts from the United States Public Health Service, various foundations, and by friends of the school. Research projects of current interest are: (1) the effect of various gonadotropic agents on oligospermia, (2) inhibition of acid phosphatase in cancer of the prostate, and (3) change of renal function preceding and following aortic coarctation repair. The laboratory staff performs special technical determinations for physicians in the state which cannot be done in general hospital laboratories.

The Urology Service offers physicians in the state postgraduate instruction in diagnostic urology on an informal basis for a period of one to two weeks.



One of the comforts that carries us through the trials of any period is the belief that nobody else ever had it so bad. This is a time when the medical profession is fair game for any writer, and the apologists for our group are hard put to keep up with the accusers. One of the continuing irritations for the average physician is the problem of the cults and the practitioners of the weird and occult healing arts. Perusal of some of the old medical journals, however, would indicate that our grandfathers contended with more rather than fewer schools of thought and if anything the identification in the patient's mind with all of these under the heading of "doctor" was even more troublesome than today.

For example, the *Medical Examiner* published in Philadelphia on December 19, 1838, quotes from one of its companion publications, *The Medical-Chirurgical Review*, an article concerning animal magnetism. With acknowledgment to the editors, J. B. Biddle, M.D., M. Clymer, M.D., and W. W. Gerhard, M.D., wherever they may be, we submit the following from this journal with the suggestion that the same attitude of good humor may serve us well in meeting the competition of these individuals:

"If the following report prove to be correct, (and it is said to be authentic,) we must, however humiliating it may be to our pride, withdraw all opposition to Mesmerism, and acknowledge ourselves to have been unreasonably skeptical on the occasion.

"A young and hysterical female had suffered much from most painful menstruation, for some years. It was proposed to try the new agent to lull the pain of back and hypogastric region, during the first day of the dysmenorrhea. For this purpose magnetized water was injected into the vagina, and a piece of nickel applied to the loins. The effect was almost magical. The whole of the uterine system fell into profound Mesmeric coma, which lasted 12 hours, after which menstruation went on calm-

ly and free from pain. The same process was employed at the next catamenial period, and with equal success. The third period passed, without pain, and without any menstruation at all.

"This was considered to be accidental, and that, at the fourth epoch, all would come right. The fourth passed, however, in the same way as the third, and the consequence of this obstruction was morning sickness, and some qualms and caprices as to certain articles of diet. Soon after this, the mammae enlarged a little, and the areola around the nipples became of a darker hue. Still later the young female became plumper about the abdomen than she used to be—and, finally there was no doubt left as to the powers of the magnetized water. The MAGNATES MAGNETICI were now in rapture, and became satisfied that the advent of a young Mesmeric Shiloh was at hand and that he would exhibit the zoo-magnetic powers in the highest degree of perfection. They confidently predicted he will not only have clairvoyance at his finger ends, but that he will be able to magnetize and somnalize every living creature at the distance of the antipodes, if desirable. . . .

"Let us come a little closer to the question. Animal magnetism must either be true or false—a fact or fiction. Suppose it be true—and see the consequences. By a single wave of the hand, we deprive a female of all sense, and throw her into such a profound sleep that the teeth may be pulled out of her head, without the slightest consciousness on her part. Should such a power on the one side and such a susceptibility on the other, be once established, no female in the realm, however high or low her station, would be one day safe from the machinations of the wicked and licentious! In short, the whole foundations of society would be broken up, and every fence of virtue and honor would be leveled in the dust!"—D.E.G.

PRESIDENT'S PAGE

DEAR DOCTOR:

We Kansas doctors have much of interest which will transpire during the coming month. Be alert about the schedule and the participation of your office assistants in the training program which begins on March 11 and ends on March 31. This OFFICE ASSISTANTS TRAINING PROGRAM is another Kansas first.

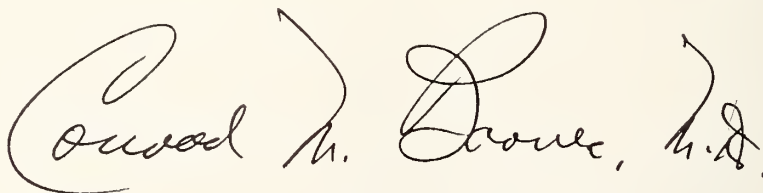
The Annual Kansas Medical Society Day at the Medical Center will be a luncheon and afternoon program for the junior and senior medical students. The program this year will feature "Expanding Horizons," Blue Shield, The Art of the Practice of Medicine, The Doctor and the Community, and a panel consisting of a minister, a young housewife and mother, a city doctor, and a country doctor. The title of the panel discussion will be "What I Want and Expect of the New Doctor in My Community."

At long last, through the voted decision of those present at the University of Kansas Medical Alumni dinner, we will have a realistic, active, and progressive organization. This will necessitate a dues increase, but the rewards to our state, doctors, and medical school will be very heartening.

Dr. Berger and Dr. Voldeng of the Kansas Division of the American Cancer Society have specifically suggested and requested that our county medical societies might credit attendance at the Mid-West Cancer Conference, March 22 and 23, 1956, to their own regular monthly meeting, thus increasing attendance at our cancer conference. This meeting is to be held in Wichita. Let's go!

Legislating medicine and "cultism" to be equal can only bring chaos. Surely the armed forces should not be the forum to find the answer to the cult problem. We doctors of medicine stand united and firm in opposing H.R. 483. Dr. James R. McVay, AMA trustee, has made an excellent presentation in opposition to this bill which would authorize the armed forces to commission osteopaths. Stuart Symington of Missouri is chairman of the Senate Armed Forces Subcommittee which is now studying this problem. Let us not be complacent!

Sincerely, in the Practice of the Art,

A handwritten signature in dark ink, reading "Conrad M. Barnes, M.D.". The signature is fluid and cursive, with the first name "Conrad" being the most prominent.

CONRAD M. BARNES, M.D., *President*

EDITORIAL COMMENT

School of Medicine Issue

For the tenth consecutive year the March issue of the JOURNAL is a special number devoted to the University of Kansas School of Medicine. As in the past, the Editorial Board is indebted to those at the school who contributed in the planning, organization, and preparation of the material included.

All former University of Kansas School of Medicine issues of the JOURNAL contained scientific papers written by members of the faculty and staff. There was no dissatisfaction with that plan, but a suggestion was made that it would also be appropriate to publish descriptive material about the school, its physical plant, progress being made, research being conducted, and programs and objectives of its different departments.

A meeting of the Editorial Board to discuss this suggestion was held last September, and Dr. W. Clarke Wescoe, dean of the school, and Dr. Vernon E. Wilson, assistant dean in charge of student affairs, were present. They graciously agreed to assume responsibility for assembling material, and the data presented in this issue resulted. Scientific papers from the university which would have appeared in March under the former plan will be published in future issues of the JOURNAL throughout the year.

The Preceptor Program

Editor's Note. The following word picture of the preceptor program now in existence in Kansas was prepared by Dr. Conrad M. Barnes, Seneca, president of the Kansas Medical Society. He is well qualified to write on the subject since he has been intimately associated with the program since its inception.

Enthusiasm is the result when you work your very best for something in which you believe. We Kansans have enthusiasm for our preceptor program. This program is the outgrowth of the work of the Rural Health Committee, which nine years ago was inspired by the proceedings of the National Rural Health Conference. This program, the result of cooperative enthusiasm between the Kansas Medical Society and the University of Kansas School of Medicine, is paying dividends in emphasizing rural general practice.

The people of Kansas are now being blessed with a more personal kind of medical care because of this wise program which welds practice, postgraduate medical training, and the student life into one har-

monious union. While participating in this program, the student, professor, and practitioner live, work, and learn together. The program completes the previously unfinished cycle of medical training and helps make the progress of medical learning a continuous thing.

Dr. Mahlon Delp, professor of medicine and chairman of postgraduate medical study, feels that our program gives the medical student a real experience in "A Medical Way of Life." This he greatly needs, for the highly specialized and organized form of group practice he experiences in the Medical Center often makes him feel that he is a small unit in a synthetic, impersonal machine which grinds out diagnoses and treatments. He needs to have the "real" feeling of living with and helping patients on a personal basis. He learns that patients want help, not a diagnosis!

The program in Kansas is operated by the Preceptorship Committee of the medical school. This committee is composed of faculty members and one participating physician preceptor who is or has been a member of the Kansas Medical Society's Committee on Rural Health. To be a preceptor in our program, a physician must be a medical society member and he must live in a town of less than 2,500 population. He must be in private practice and not a member of a clinic or group. He is appointed by the medical school after having been nominated for this position by either the medical school faculty or the medical society. He must be approved by both of these institutions.

When Dr. Jesse D. Rising, chairman of the Preceptorship Committee, called an all day meeting of the committee and a panel of physicians on November 7, 1954, a good representation of the 60 preceptors was present. The proceedings of this meeting concerned nearly every phase of the actual everyday problems and adjustments needed to properly administer and execute the program.

Presently, the length of time the student spends with the preceptor is six weeks. Various time intervals have been utilized since the inception of the program, but six weeks appears to be the most satisfactory. Both junior and senior students participate, and each preceptee must "serve his time" and be evaluated by his preceptor before he can qualify for the degree of Doctor of Medicine. When he returns to the medical school after completing his preceptorship, the student reports on the qualitative and quantitative aspects of his experience and gives the dean of the medical school, Dr. W. Clarke Wescoe, an evaluation of the preceptor's ability and willingness to be a teacher.

This "Medical Way of Life"—the preceptorship—introduces medical students to rural practice. It gives

students an opportunity to see patients in their home environment. It encourages young men to consider entering rural practice. It will improve rural medical care.

While working under the supervision of the general practitioner, the student is given responsibility for patient care in the office, on house calls, and in the rural hospital. The student assists in obstetrical work and surgery, and he participates in the civic and social life of the preceptor as well. He participates in and experiences the recreational facilities of rural life, attends church and service clubs. The preceptor and student have consultations on medical and medical-economic problems and attend local county medical society and hospital staff meetings together.

The student receives maintenance from the preceptor, but he is paid no salary. The preceptor cost of providing this maintenance for the preceptee is estimated by our preceptor group to be between \$200 and \$300. It is not mandatory, but most of the preceptees live in the home of the preceptor as an "adopted" member of the family during the six weeks period. This is an enriching experience for all concerned and, for the student, it gives an opportunity to project himself forward for three to 30 years. Does he want his family to live as this "adopted" family? If not, what will he do differently?

I have been a preceptor since the beginning of the program in Kansas. My wife has been a great help in the program for, aside from making a "home" for the preceptee, she has told him her attitudes as a doctor's wife.

It is our custom to invite the wife or sweetheart of the preceptee for a visit in our home during the last few days of the preceptee's stay with us. The pride and confidence with which the young student doctor shows her our home and our town and countryside are proof enough of the favorable attitude that is being established. A wise philosopher has said, "Attitudes are even more important than facts."

An important end result of the preceptorship program should be to encourage those men who feel an inclination toward rural practice and general practice into these fields and to prevent those who do not feel so inclined from attempting it. By the presently avowed, necessary nature of our medical schools, the student is in contact only with the specialist and group practice. In this program he gets a look at the other side of medicine whether he chooses to practice it or not.

Everyone profits from the preceptorship program. The "people," called patients by doctors, have better individual care. Six hundred doctor weeks are added to community health service. This is good public relations. There is a removal of pressure on the part of state and local authorities for more adequate medical

care. The general practitioner and the medical school realize that each patient is a potential vote against socialized medicine. Because of increased community benefits, there is better understanding between medical schools and their state legislatures.

The medical student profits from the preceptorship program, for he not only lives "a medical way of life," but he is given an opportunity to make a better choice as to the type of practice he chooses to follow. He can make a financial and professional evaluation in making a practice choice while he is being stimulated to embrace general practice in a rural area.

There is improved inter-professional relations as a result of the preceptorship program. The preceptor is included in the medical school program. He is a member of the faculty. He becomes a more perfect physician. He now works with the specialist. There is mutually more respect for the general practitioner and the medical school. The integrated postgraduate program creates wide attendance and is another step in better understanding. A student who elects specialty work, after being exposed to the work of the rural general practitioner, is more aware of the patient's home environment and respects him as a person.

Personally, the physician feels honored by his medical brothers to be selected to participate in such a program. On the basis of the Golden Rule, he is paying back a teaching debt. There is no financial pay equivalent to the honor bestowed upon the preceptor by the preceptee who in true Hippocratic reverence, "honors as his father, the man that teaches him the art."

The preceptor program is not designed to depreciate the specialist, but to get the right man in the right place and to help both practitioner and specialist to help each other. The preceptorship program will help to cure the medical sickness which now exists because of a maldistribution of physicians. This maldistribution is due to the confusion that exists in the minds of many patients. About 40 per cent of all physicians are specialists, but 90 per cent of illness could be taken care of by a general practitioner.

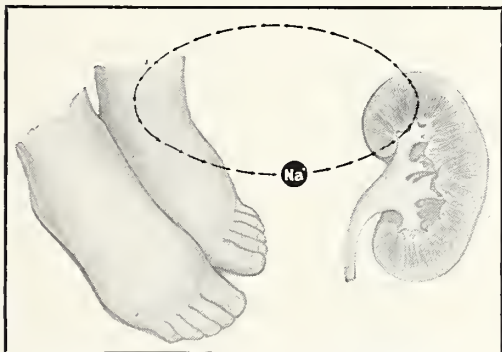
There is a real need for general practitioners in many rural areas. More general practitioners will cure the "sickness" of the medical profession. But we physicians must heal ourselves. We believe that the augmentation and coordination of our preceptor and postgraduate programs will cure the "sickness" in Kansas. At present, 80 to 90 per cent of our preceptees are becoming practitioners in rural communities. These are good results. Our belief in our preceptorship program is justified. Our enthusiasm is increasing.

Vacant areas, where physicians were sadly needed,

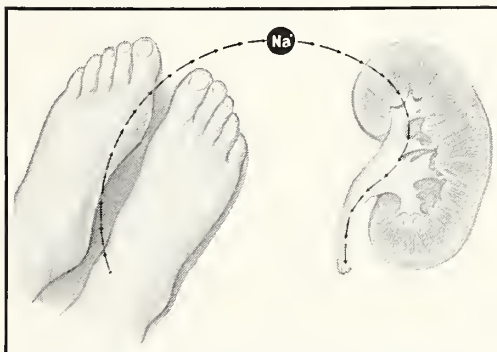
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are being filled. Our doctors are better informed. We are enjoying improved public relations. We are enjoying improved inter-professional relations.

What prophecy can we make for the future of the preceptor program? Well, do you think it could ever happen that our city brothers and cousins might learn something from us country folks? I think so! I believe that an urban health committee with a program patterned after our rural preceptor program would be a wonderful help in solving the needs of city patients for more general practitioners.* No doubt this will be the next step forward in our continuing program of a lifetime of medical training for the doctor and a personal physician for every patient. Perhaps this will be the last phase of curing our existing but improving medical sickness.

* Since this article was prepared, a program of intramural or urban preceptorships has been started, and there are 22 preceptors in this category at present.

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

All too frequently overlooked in Congressional activity on health and related bills each year are the little-publicized but highly important appropriations measures—without which no program of the federal government could move forward. The appropriations hearings in the House (where all money bills must originate) rarely get headlines as they are conducted behind closed doors. Weeks and sometimes months later, the hearings are published, but by then the bill supplying money for an agency has been reported to the House.

It's only when the measure gets to the Senate that private groups and individuals are heard—by then in open sessions. Closed House sessions are not new. That is the way it has been done ever since Congress set up a separate committee on appropriations back in 1865.

The importance of appropriations in running the federal government was clearly illustrated when the President submitted to Congress his 1,272-page budget message in which he sought \$65.9 billion for all federal programs for the fiscal year beginning July 1.

While there was no overall total of projected spending by all the agencies in the health field, the budget requests for the Department of Health, Edu-

cation, and Welfare showed a sharp upward trend. And if certain new legislation is voted on this session—like the projected five-year program of construction grants for medical schools and private laboratory facilities—the total figure for subsequent years is likely to be even higher.

On the medical school-laboratory construction bill, the President asked Congress for \$40 million for the first year (estimated cost over five years is \$250 million). Construction grants, which would have to be matched on a 50-50 basis, would be available for private medical schools as well as non-federal laboratories conducting research into a wide range of crippling diseases.

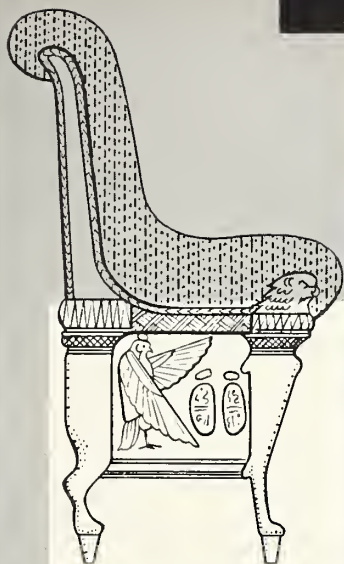
The budget message also calls for another \$30 million in outright grants to the states to help them in financing poliomyelitis vaccination programs, the same amount appropriated by Congress last session. The administration in a separate request asked for extension of the polio law, from February 15, 1956, to June 30, 1957, and both the House and Senate with only brief debate voted the 17-month extension. Since only half of last year's \$30 million was spent up to the February 15 expiration date of the original act, there was no rush for Congress to act on the new account.

Other new spending asked by the administration, contingent, of course, on enabling legislation, includes \$10 million for initial capitalization of mortgage loan guarantees for health facilities; \$5 million for graduate and practical nurse and professional health personnel training, \$3 million for water pollution grants; \$1.5 million for mental health expansion programs; and \$1 million for sickness and disability surveys in the U. S.

If Congress approves the requests, virtually all segments of the Department of HEW will have more money to spend than in this fiscal year. None would benefit more, however, than the medical research arm of government, the National Institutes of Health. The total sought for the seven institutes is 28 per cent more than estimated spending this year. Here are some examples: National Cancer Institute, \$32,437,000, up 29 per cent; National Heart Institute, \$22,106,000, up 17 per cent, and the National Institute of Allergy and Infectious Diseases (formerly the National Microbiological Institute), \$9,799,000, a 26 per cent increase.

The President requested \$130 million for the Hill-Burton hospital-clinic construction program which will be 10 years old this August. In this connection Congress has been asked to extend the act for two years beyond next year, and action is expected this session.

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Tumor Conference

Retroperitoneal Seminoma

Edited by F. Q. WINGFIELD, JR., M.D.

Dr. Helwig: The case to be considered is that of a seminoma which shows some unusual manifestations.

Dr. Proctor: This patient is a 40-year-old white man. His presenting complaint was pain in the right flank and chills and fever and pain in the right hip. The patient had been studied in May of this year in another hospital because of the same symptoms. Roentgenologic studies of the gastrointestinal tract and gall bladder and an intravenous pyelogram were negative. He was given cortisone, since the pain was thought to be due to arthritis. The patient did well until a week prior to admission to this hospital, when he developed chills and fever and a marked exacerbation in his pain. The physical examination was essentially negative except for a mass that was palpable in his right flank. The mass was tender and palpable by rectal examination. The results of blood and urine studies were normal. The admission diagnosis was psoas abscess.

At operation an incision was made in the right flank. The tumor mass was exposed and was found to be much larger than was anticipated. It involved the right ureter, vena cava, and aorta and extended across the midline between the third lumbar vertebrae and the sacrum. Attempts to remove the tumor were stopped because of the patient's condition.

Seven days later the tumor mass was excised en bloc. Dr. Hardin will tell more about that.

Dr. Helwig: Would you discuss the x-rays, Dr. Todd?

Dr. Todd: These x-rays are of interest because they show the psoas muscle shadow to be well delineated. This is one of the unusual instances in which the psoas muscle shadow is seen to bulge quite definitely far to the right. Since the muscle was so sharply demarcated, we do know that there was something behind the muscle instead of in front of it. A perinephritic abscess simply wipes out the psoas muscle shadow. Thus that diagnosis is easily excluded. The urogram shows that the right kidney has poor excretory function. The kidney shadow is not visualized in this study. The left kidney is normal. The retrograde urogram shows hydronephrosis on the right. The right ureter is widely displaced laterally

to the right, and the kidney is displaced upward and tilted laterally by this bulging mass. The radiographic diagnosis is between a psoas abscess and a retro-psoas tumor. Because of the lack of other evidence of infection, such as destruction of bone in the area of the abscess, which one usually finds in a cold abscess, this was considered most likely to be a neoplasm. The first choice would be a lymphoma. A chest x-ray was normal.

Dr. Helwig: Do you think the mass had grown to that size in five months?

Dr. Todd: I believe it had. His previous x-rays showed a normal intravenous pyelogram and a slight bulge in the muscle, which had increased about three to four times.

Dr. Helwig: Dr. Boley, will you discuss the surgical specimens?

Dr. Boley: The surgical specimen containing the tumor weighed 450 grams and was 16 by 10 by 12 cm. Three centimeters from the pelvis there was an inflammatory lesion which constricted the ureter and caused the hydronephrosis. In some areas the histologic picture resembled a renal cell carcinoma and in others it resembled a sarcoma, but most of the tumor presented a classical picture of seminoma and this was the final diagnosis.

Dr. Helwig: What were the findings in the testicles?

Dr. Proctor: They were examined repeatedly and were found to be normal to palpation.

Dr. Helwig: Were there any tubular elements seen microscopically that might favor a diagnosis of a teratoid tumor with predominantly a seminomatous pattern?

Dr. Boley: No.

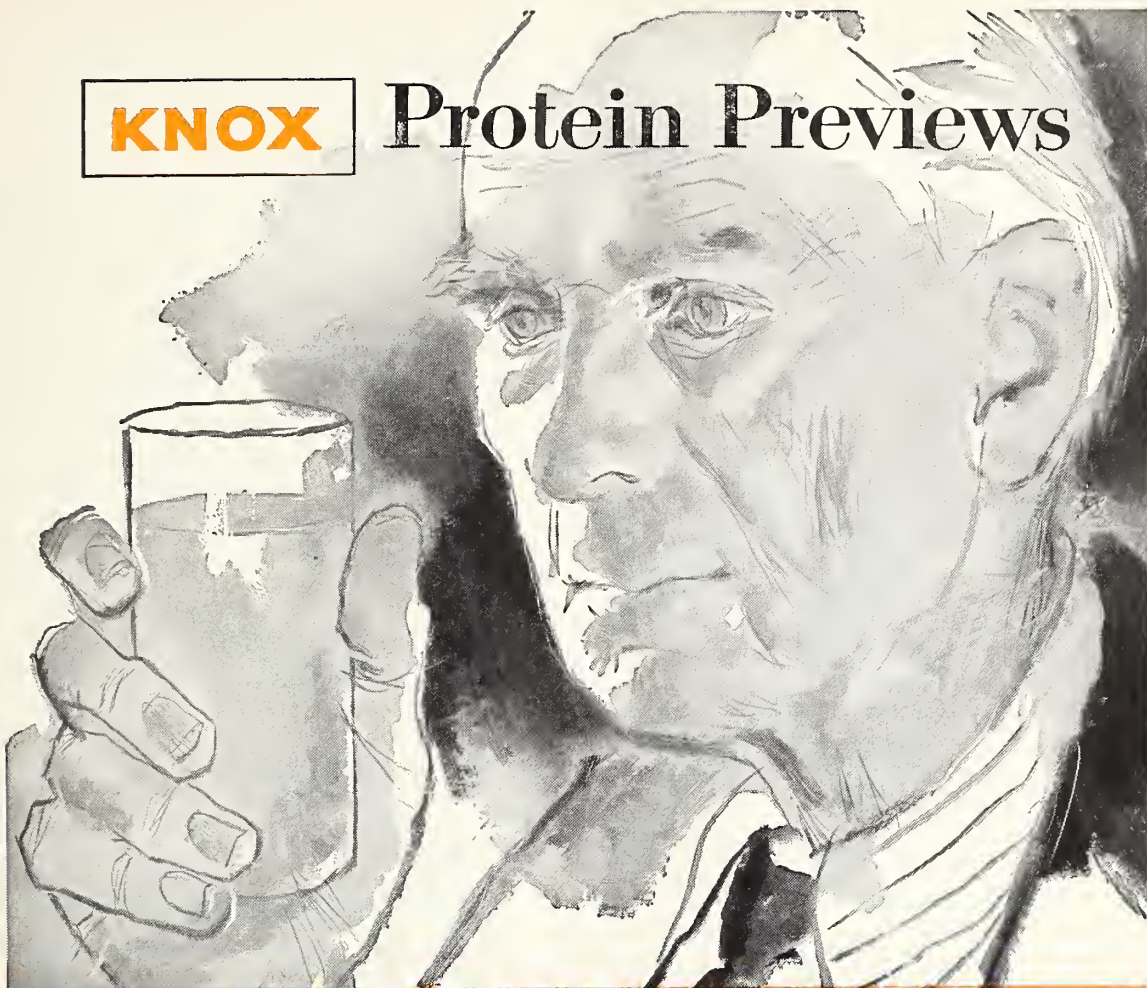
Dr. Helwig: Dr. Hardin, would you please discuss this case?

Dr. Hardin: This patient is 40 years of age and had no signs of metastases in the abdomen, chest, or testis. The extensive necrosis at the superior pole of this tumor probably accounts for the chills and fever. Because of the likelihood of death of this patient by hemorrhage from the tumor, the likelihood of venous spread of the tumor, and because the very nature of the tumor was in doubt, we decided that perhaps the best chance for this patient would be to radically extirpate the tumor and give postoperative irradiation. The kidney was removed because of the hydronephrosis. The growth of this tumor had

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Wingfield is a Trainee of the National Cancer Institute.

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caused compression of the vena cava with complete thrombosis. The patient has had no swelling of the extremities because of the chronic nature of the venous obstruction. The vena cava was ligated above the tumor and the iliacs below it. The left renal artery had its origin above the tumor. The patient was operated on under hypothermia, and an occluding clamp was placed proximal to the renal artery, occluding the main renal circulation for a half hour. A block resection of the entire tumor and involved aorta and vena cava was done, and a prosthetic aortic-iliac graft was substituted. The patient withstood the operation satisfactorily. The urinary function is adequate, and it was 480 cc. two days after operation.

Dr. Fink: Will you remove the testicle for the possible primary tumor?

Dr. Hardin: This poses a challenging problem. Which testicle are we going to remove?

Dr. Helwig: Dr. Mantz, would you like to comment on the presence of hidden or occult seminomas producing such bulky retroperitoneal metastasis?

Dr. Mantz: Examples of teratomas and choriocarcinomas in the gonads which regress to leave only a scar or are too small to be recognized except by study of serial microscopic sections, yet have massive metastases elsewhere, are occasionally seen.¹ Some, but not all, of these patients show evidences of endocrine imbalance. Most such tumors have been classified as choriocarcinomas.

Extragenital tumors, again principally teratomas and choriocarcinomas, have been reported,¹ principally in the retroperitoneal areas, the mediastinum, and pineal region. Tumors of this type may arise from embryonic rests of the urogenital ridge capable of differentiating toward the germinal tissue from which such tumors may arise. These tumors may represent a mixture of cellular types and could be principally of a seminomatous variety. The extragenital choriocarcinomas of the pineal and mediastinum are thought to arise from teratomatous tissues in these sites. No diagnosis of extragenital tumor of this type can be established in the absence of careful microscopic study of serial sections of the gonads. This is especially true if the tumor occurs in a feasible site of metastases of a gonadal tumor, as in this case.

Dr. Helwig: Did hormonal assays reveal any abnormal endocrine secretion, Dr. Hardin?

Dr. Hardin: Hormonal assays showed that the 17-ketosteroids were 3.6 mg./24 hour (normal 8-22) and the 11-oxycorticosteroids were 2.2 mg./24 hour (normal 1-3).

Dr. Helwig: Dr. Todd, how sensitive is this tumor to irradiation?

Dr. Todd: Seminoma is the most radiosensitive tumor of the testicle, and there has been as high as 80 per cent five-year arrests reported with a combination of surgery and radiation when the tumor is con-

fined to the testicle. There have been a number of cases apparently cured by irradiation alone. When retroperitoneal metastases are present five-year survival is about 40 per cent.²

ADDENDUM

Following the operation x-ray therapy was started and continued on an out-patient basis. He received 2470 r to the pelvis and 3920 r to the right paravertebral area. The patient gained 15 pounds and returned to work on a half-day basis. Four months after operation, he suddenly developed hematemesis and melena. He was readmitted, and a total gastrectomy was done for multiple benign gastric ulcers. Thirteen days later he expired. Autopsy revealed that a small aortic aneurysmal dilatation just proximal to the aortic graft had perforated into the duodenum. No viable residual tumor was found. Careful examination of the testes revealed a 5 mm. focus in the right testis which microscopically consisted of necrotic cells resembling seminoma surrounded by a rim of fibrous tissue. It was thought that the irradiation to the pelvis or conceivably spontaneous regression accounted for the necrotic appearance of the cells.

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DEATH NOTICES

ROBERT CAMPBELL McILHENNY, M.D.

Dr. R. C. McIlhenny, 61, Conway Springs, a member of the Tri-County Medical Society, died on February 9 at Tucson, Arizona, where he was vacationing. Death followed a stroke. Dr. McIlhenny was graduated from the University of Kansas School of Medicine in 1923 and had been in practice in Kansas since that time.

MARLIN SAMUEL MCCREIGHT, M.D.

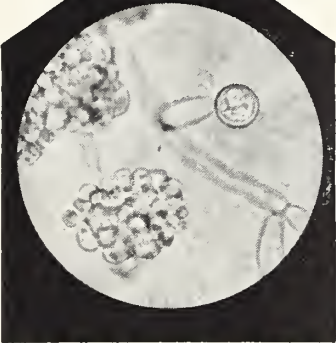
A physician who had practiced in Oskaloosa for 60 years, Dr. M. S. McCreight, 85, died at a Topeka hospital on February 10. After receiving a degree in pharmacy, Dr. McCreight entered Rush Medical College, Chicago, and completed his work there in 1894. He was an honorary member of the Jefferson County Medical Society.

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PHYSICIANS' ACTIVITIES

Dr. John B. Dixon, Parsons, has announced plans to move to Wichita on April 15 to begin practice in ophthalmology at the Wichita Clinic.

Dr. Frederick E. Totten, Wathena, went to McDowell, Kentucky, last month to serve as a staff member of a new hospital for coal miners. His practice in Wathena will be taken over by **Dr. Evan Peterson, Jr.**, a graduate of the State University of Iowa College of Medicine.

Dr. A. M. Pederson, Plainville, was recently named coroner of Rooks County to succeed the late **Dr. E. C. Petterson**. **Dr. Vale Page** was appointed county health officer.

The Hertzler Clinic, Halstead, announces that **Dr. Emmet McCusker**, a radiologist, is now a member of its staff. Dr. McCusker, a graduate of the New York Medical School, has been in private practice in California during the past five years.

Dr. Warren McDougal, who has been practicing in Colby since his return from military service in Korea, moved to Atwood last month and has opened an office there.

Three Wichita physicians, **Dr. Arthur H. Bacon**, **Dr. William R. Miller**, and **Dr. John G. Shellito**, were speakers at a recent meeting of District Six of the Kansas State Nurses' Association.

Dr. Charles K. Wier, Wichita, announces that **Dr. Ward A. McClanahan** is now associated with him in the practice of orthopedic surgery.

Dr. Richard Conard, Emporia radiologist, addressed the Rotary Club of Emporia recently on the subject of isotopes in medicine.

A physician who has delivered more than 5,000 babies during his 50 years of practice, **Dr. J. A. Simpson**, Salina, was the subject of a feature story in the *Salina Journal* recently.

Dr. R. Dale Dickson, Topeka, was elected to membership in the American Academy of Allergy last month.

Dr. Charles O. Hoover, Quinter, was guest of honor at a banquet given on February 3 by the Quinter Chamber of Commerce. He has practiced in that community for 31 years, and in recognition of his service was given a lifetime honorary membership in the organization.

Dr. and Mrs. E. N. Robertson, Concordia, returned last month from South America where Dr. Robertson attended the Pan-American Congress of Ophthalmology at Santiago, Chile. Their son, **Dr. Norris Robertson** of Oklahoma City, presented a paper, "Congenital Glaucoma," at the congress.

Dr. Larry L. Calkins, of the University of Kansas Medical Center, presented a paper on the phylogeny and ontogeny of the placental mammalian eye at a meeting of the Oklahoma City EENT Society in January and later presented the same paper before the Colorado Ophthalmological Society in Denver.

The Nelson Clinic, Manhattan, announces that **Dr. Elbert D. McNeil**, formerly of Satanta, is now a member of its staff. Dr. McNeil, a graduate of the University of Colorado School of Medicine, recently completed a residency in pediatrics at the Mayo Clinic.

Dr. William H. Fritzemeier, Wichita, has been installed as chairman of the Sedgwick County Medical Service Bureau Board, a Red Feather agency. **Dr. D. Cramer Reed** is also a member of the board.

Recent developments in psychiatry were discussed by **Dr. DeMerle Eckart**, Hutchinson, at a meeting of the Reno County Mental Health Association on February 14.

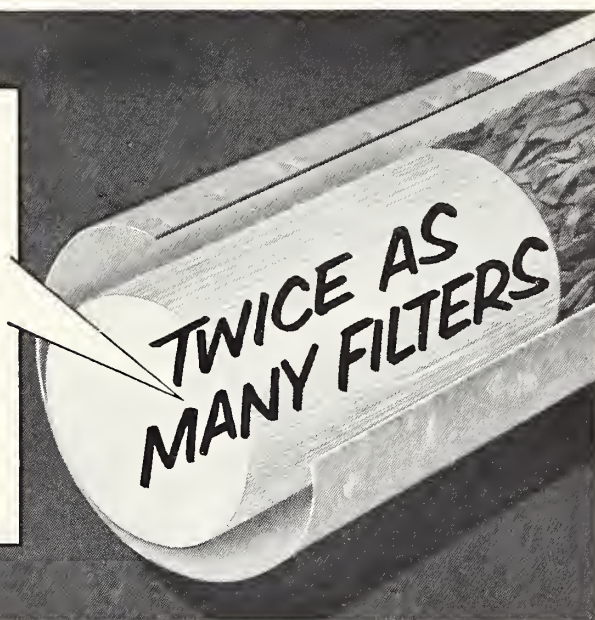
A pathologist, **Dr. W. P. L. McBride**, formerly of McFarland, Wisconsin, has joined the staff of the St. Joseph Hospital in Concordia. Dr. McBride is a diplomate of the American Board of Pathology.

Mental illnesses and emotional disturbances in children were discussed by **Dr. Paul C. Laybourne**, of the University of Kansas Medical Center, at a meeting of the Arkansas City Mental Health Association last month.

Dr. Max S. Lake, mayor of Salina, was speaker at capping ceremonies for student nurses at Marymount College in Salina recently. He discussed the history of nursing and the responsibilities of nurses.

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Magnesium

Its Role in Metabolism

ROBERT W. BROWN, M.D., Kansas City

INTRODUCTION

Magnesium salts have been used for many years in the treatment of delirium tremens,^{15, 27} toxemia of pregnancy, certain cardiac arrhythmias,⁶⁴ as a muscle relaxant in various hyperactive states, and as an aid in anesthesiology.^{54, 62} Its use in these conditions has been largely predicated on its known action of suppression of nerve and muscle irritability.^{8, 54, 61, 62, 64}

Hirschfelder reported relief of muscular twitching in four patients treated with magnesium sulfate who were known to have low serum magnesium levels. Miller⁵² reported a case of a six-year-old child with tetany and convulsions associated with normal calcium, phosphate, and carbon-dioxide levels, but with a low serum magnesium who responded dramatically to magnesium therapy. A few other reports of clinical symptoms as a result of magnesium deficit are in the literature,^{27, 28, 37, 47} but precise clinical information concerning magnesium metabolism has lagged behind recent studies on other important cations in the body.

MAGNESIUM DEFICIENCY IN ANIMALS

A fairly definite syndrome has been demonstrated in various animals on a magnesium deficient diet. Kruse, Orent, and McCollum in 1932 found that weaned rats on an essentially magnesium free diet developed vasodilatation and hyperemia in the peripheral vascular bed in from three to five days. This was followed by peripheral pallor and cyanosis in 12 to 14 days, with increasing hyperirritability of the nervous system including tetany. Beginning on about the 18th day, the animals developed tonic and clonic convulsions which were followed by death. Animals in the later stages showed cardiac arrhythmias and died of respiratory arrest.⁴²

Other workers confirmed these findings in rats,^{3, 11, 16, 17, 57} dogs,⁵⁶ rabbits,³ cattle,^{1, 23, 59} and chicks,⁶ with some species variation. A disease in cattle called "grass staggers" has been reported by Sjollem, in which cows become restless and nervous, have an unsteady gait, muscle twitching, gnashing of teeth, and tonic and clonic convulsions. He was able to show this was associated with low serum magnesium levels

and responded to magnesium therapy. Duncan, Huffman, and Robinson demonstrated magnesium tetany in calves on a ration of milk with various supplements.

Magnesium deficiency in animals is made worse by certain variations in diet. Tufts and Greenberg found that high calcium intake caused increased severity and rapidity of onset of symptoms in magnesium deficiency. Adult protein depleted rats on a high protein and low magnesium diet gained about one-tenth as much as similar animals on a high protein and high mineral diet.⁵⁰ It was found that the weight gain presumably due to protein synthesis was

Recent investigations into the variations in serum magnesium in certain disease conditions point to the possibility that magnesium deficiency may complicate these states more than is generally appreciated. Hypomagnesemia occurs in several disease states, but studies are necessary to further elucidate the significance of low serum magnesium per se and alterations in tissue magnesium which occur concomitantly.

Many important enzymatic reactions in human cells depend on the presence of magnesium, and there is some evidence to indicate that critically low magnesium levels may play an important part in producing clinical symptoms in cirrhosis of the liver, diabetes, and certain types of renal disease.

inversely proportional to protein intake.⁵¹ A high protein diet and magnesium deficit resulted in minimal weight gain and produced symptoms of magnesium deficiency, whereas low protein and low magnesium produced no symptoms and good weight gain. This suggests that magnesium requirement increases with increased protein intake, and the requirement is more than that necessary for inclusion in the tissue formed. Colby and Frye found that a large intake of potassium, calcium, and potassium, or of protein, enhanced magnesium deficiency.

Total magnesium increases in muscle, heart, and kidney during the first stages of magnesium deficiency.

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Brown is now serving his internship at the University of Kansas Medical Center.



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cy, then decreases to about one-third of normal by 15 days.^{20, 30} Brain and muscle magnesium content decrease sharply during the second phase (hyperirritability and convulsions). The serum magnesium levels fall the first six days and then stabilize at about one-half normal, finally rising just prior to the stage of convulsions, but do not return to normal levels.⁴³ Hevesy has shown that skeletal magnesium is highly labile and forms a reserve easily drawn on by soft tissues, which appear to have a priority.³⁶ Whether the onset of hyperirritability and convulsions occurs as bone magnesium reserves are exhausted has not been determined. The return of magnesium to bone after depletion is, however, a slower process than its removal.³⁶

INTRACELLULAR AND EXTRACELLULAR DISTRIBUTION OF MAGNESIUM

Next to potassium, magnesium is the most plentiful intracellular cation. The distribution of magnesium throughout the body compartments has been estimated by Eichelberger to be about 30 mEq./L. per kilogram of intracellular water as compared with 1.5 mEq./L. per kilogram of extracellular water. According to Martin, body magnesium is distributed as shown in Table I.

TABLE I
Magnesium in Normal Human Body

	Vol. mEq./L. Tot. mEq.		
Plasma	3.5	1.83	6.4
Interstitial fluid	10.5	1.83	19.2
Intracellular fluid	35.0	45.00	1575.0
Total	49.0		1600.6 (19.0 grams)

Factors which cause magnesium to move from one compartment to another have not been completely worked out, but it apparently reacts similarly to the potassium ion.^{10, 24, 48, 67} Terkildsen showed that intercellular magnesium was increased about 15 per cent during the first six hours of shock states due to hemorrhage, operation, anaphylaxis, and anoxia. It then decreased to 5 per cent below normal and, after two to three days, again rose to normal levels. Serum magnesium levels rise after extirpation of the adrenal glands,⁴ in diabetic acidosis and coma,^{2, 10, 14} and after administering parathormone.⁶⁰ High serum magnesium levels have been reported in oxalic acid poisoning,⁷¹ following the use of oral epsom salt in congenital megacolon, in severe renal disease,^{12, 25, 34, 37} and hyperthyroidism⁶⁰ as well as the above.

Haury and Cantarow found low serum magnesium levels in some patients with diabetes, toxemia of pregnancy, neoplasms, chronic arthritis, and epilepsy. Low levels have also been reported in patients with asthma, lupus erythematosus, hypothyroidism,

pancreatitis, after prolonged use of magnesium free intravenous fluids, and in cirrhosis.^{27, 35, 46, 47, 48}

PATHOLOGICAL LESIONS RESULTING FROM MAGNESIUM DEFICIENCY

No pathological lesions secondary to magnesium deficiency have been reported in man.²² In the rat lesions consisting of deposition of calcium salts in the yellow elastic fibers of the endocardium, aorta, jugular vein, and larger arteries are produced. Similar deposits were found on the surfaces of the diaphragm and in the trabeculae and capsule of the spleen. The Purkinje fibers in the heart showed calcification and degeneration.^{11, 31, 53}

Schrader⁵⁷ described the liver grossly as appearing pale, mottled, and flabby with some areas of severe necrosis. Microscopically there was congestion, vascular proliferation, and perivascular round cell infiltration, with numerous areas of scar tissue with marked lymphocytic and phagocytic infiltration. He described the massive necrosis as predominantly periportal, the degenerated areas being practically acellular except for a few pyknotic nuclei and numerous phagocytes containing debris. The borders of the lesions were sharply defined, but all liver cells showed foaminess of the cytoplasm. He was not successful in obtaining massive necrosis in the livers of all animals, however.

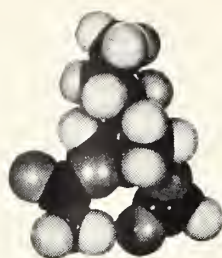
Kidney lesions consisted of degeneration of the tubules with necrosis of tubular epithelium and glomerular injury.

Bird reported degenerative changes in the cerebellum of chicks, and Barron noted chromatolysis and degeneration of Purkinje cells of the cerebellum in the rat and rabbit.

SERUM MAGNESIUM

Normal serum magnesium levels range from 1.5 mEq./L. to 2.5 mEq./L.,^{5, 63} depending on various techniques in determination.^{21, 40, 41, 68, 72, 73} Hirschfelder found that about 40 per cent of ingested magnesium is absorbed from the intestinal tract, the other 60 per cent being excreted in the feces.³⁸ The mechanism of absorption from the intestine is unknown, and serum levels do not rise significantly with large oral dosages except when there is preexisting renal disease.

In chronic renal disease low, normal, or high serum magnesium levels have been reported.^{12, 25, 33} The magnesium level somewhat correlates with the potassium serum levels, but sufficient studies have not been done to know whether these changes are constant and significant. Martin⁴⁷ was unable to correlate serum magnesium levels with non-protein nitrogen or creatinine levels and magnesium renal clearance. They were unable to demonstrate renal tubule secre-



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tion of magnesium such as that which exists with potassium.

The first patients reported had low serum magnesium levels and severe kidney disease. Hirschfelder reported 11 patients, some of whom had generalized muscular twitching and were either comatose or approaching coma. All had low serum magnesium levels (0.95 to 1.31 mg./100 cc. plasma) and were treated with magnesium sulfate by mouth. Rapid rises in serum magnesium levels resulted in all patients with marked clinical improvement of symptoms.

Haury and Cantarow investigated this aspect further and concluded that epsom salt purgation in severe nephritis could produce dangerously high serum magnesium levels. Studies by Smith, however, would tend to refute this, since he found that serum magnesium levels of less than 10 mEq./L. caused bradycardia, flushing, sweating, vomiting, and decreased blood pressure, but much higher levels were necessary to produce coma. Etteldorf studied the effects of magnesium sulfate on renal function in children with acute glomerulonephritis and found that serum levels were raised from 2.7 to 4.4 mEq./L. The only effect was to lower blood pressure from 10 to 30 mm. diastolic.

MAGNESIUM IN ENZYME SYSTEMS

Magnesium has many functions in the body. It is an important part of bone structure.²⁶ It is a divalent cation which combines to form a metalloenzyme complex which is involved in carbohydrate and protein metabolism. The anerobic deamination of DL-serine by cell free extracts of many animal species proceeds extensively with the formation of pyruvic acid on the addition of magnesium ions.⁷⁴ Glutamic acid gets into the citric acid cycle by way of alpha keto glutaric acid, the reaction depending on magnesium ions.⁷⁸

Magnesium catalyzes the action of aspartic and glutamotransferases,³² is active in the oxidation of propionic acid,⁷⁵ and is required in the conversion of flavin mononucleotide to flavin adenine dinucleotide.³²

The enzymatic synthesis of glutathione from glutamic acid and cysteine requires the presence of magnesium to catalyze the hydrolysis of inorganic pyrophosphate into orthophosphate ions.⁷

The antibiotics, chlortetracycline, oxytetracycline, and tetracycline uncouple oxidative-phosphorylation and inhibit the oxidation of octanoate in liver mitochondria preparations. The effect of the antibiotics is greatest at low magnesium concentration. This is probably through formation of a complex by the antibiotic and the magnesium ion.⁹

Magnesium has also been shown to enhance the

coagulative and complement activities of blood serum.⁴⁵

The role of magnesium in acid-base balances in the body has not been adequately studied, but it probably is of importance since it is one of the more plentiful cations in the body.

CLINICAL ASPECTS

Few clinical and no pathologic changes due to magnesium deficiency have been reported in man. The rapid severe manifestations of magnesium deficiency in animals would make it likely that some degree of this deficiency state might become manifest in man under certain conditions. The chronic alcoholic suffering from multiple dietary deficiencies would seem to be a likely candidate for magnesium deficiency.

Flink and others studied 30 patients with chronic alcoholism and delirium tremens. All had low serum magnesium levels. They divided the patients into three groups: (1) chronic alcoholics with tremor but without frank delirium; (2) chronic alcoholics with tremor and mild delirium, and (3) chronic alcoholics with severe delirium tremens.

The mean magnesium serum concentration in the first group was 1.47 mEq./L. Some were treated with magnesium sulfate and some with other forms of therapy including large doses of vitamins. In the second group the mean magnesium concentration was 1.46 mEq./L. Four of the seven in this group were treated with magnesium sulfate. In the third group the mean magnesium concentration was 1.29 mEq./L. All ten patients in this group were treated with magnesium sulfate. In this series those patients treated with magnesium responded better than those treated otherwise.

Delirium tremens had previously been treated empirically with magnesium sulfate with good results.^{15, 76, 77} It is well known that most patients with delirium tremens recover spontaneously with sedation and an adequate diet. Some patients in the group above were not given magnesium and made a fairly prompt recovery. However, six of this group were getting progressively worse on other forms of therapy and were improved when magnesium was given. There is not good correlation between low serum magnesium levels and symptoms, since even after recovery all the above patients continued to have low serum magnesium levels, especially those with associated cirrhosis of the liver. Flink concluded, however, that the severity of the symptoms is roughly proportional to the initial magnesium concentration.

Magnesium has been shown to enter liver cells during carbohydrate anabolism.¹³ The behavior of magnesium in diabetes mellitus has not been extensively pursued. Martin⁴⁸ found that serum levels somewhat paralleled potassium levels, being elevated

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in severe untreated acidosis and falling as insulin takes effect in treatment. However, in diabetic coma with anuria, magnesium levels remained high and potassium levels were below normal. In anuric patients, magnesium serum levels ranged from 6.3 to 9.3 mEq./L., with potassium values as low as 1.96 mEq./L. Despite intravenous potassium therapy, potassium levels did not rise significantly, and three of five of these patients died.

Smith showed that the injection of magnesium sulfate caused a depression of serum potassium with alterations in respiration and flaccid paralysis. By giving potassium and magnesium together, the potassium levels remained near normal and respiratory depression did not occur, but the paralysis was not abolished.⁶¹

Urinary magnesium is increased during the period of developing acidosis but apparently varies with hydration and urinary volume.

Magnesium has been shown to modify the function of cardiac muscle and its conduction system. Acting alone on the heart it produces a sinus bradycardia followed by AV block, auricular standstill, and a slow idioventricular rhythm. In humans with cardiac arrhythmias due to digitalis poisoning, magnesium abolishes ventricular extrasystoles, tends to restore a regular sinus rhythm, and interrupts ventricular tachycardia. Atropinization causes no change in response of cardiac muscle to magnesium.⁶⁴

In congestive heart failure, magnesium serum levels fall sharply with a rise in urinary magnesium during diuresis induced with mercurhydrin and ammonium chloride.⁴⁷ Ammonium chloride will produce a negative magnesium balance.⁶⁶ It is known that there is an obligatory loss of magnesium in the urine, but whether the increase in urinary magnesium is a result of increased urine volume alone or if other factors produce an accelerated excretion is not known. Cation exchange resins given to patients with congestive heart failure cause no alteration in serum magnesium levels except during the initial diuresis.⁴⁷

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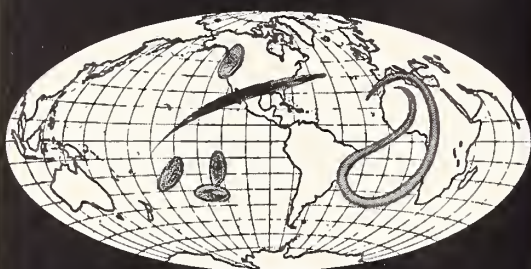
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Medical Education Week

Local programs to focus attention on National Medical Education Week, April 22-28, are being promoted by the American Medical Association with distribution of kits containing a wide variety of suggestions and aids for radio, television, newspapers, magazines, and community organizations. The kits were mailed in February to 700 chairmen selected by local medical societies. It is the hope of the A.M.A. that the American people will learn, during National Medical Education Week, of the accomplishments and objectives of the nation's medical schools.

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Bumbalo, T. S., Gustina, F. J.,
and Oleksiak, R. E.:
J. Pediat. 44:386, 1954.

White, R. H. R., and
Standen, O. D.:
Brit. M. J. 2:755, 1953.

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Brown, H. W.:
J. Pediat. 45:419, 1954.

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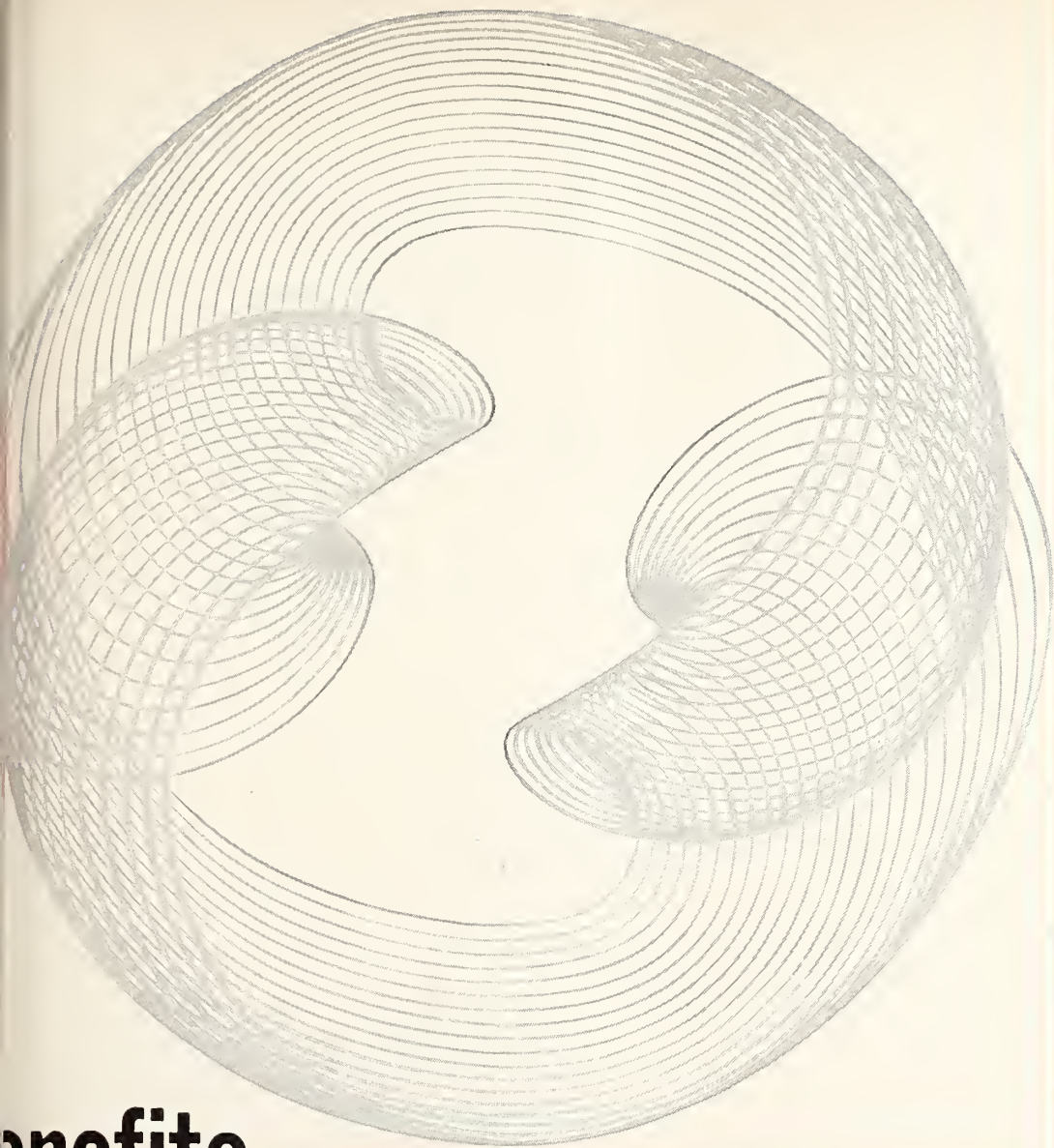
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COUNTY SOCIETIES

Col. Charles H. Roadman, U.S.A.F., MC, director of Research and Development for the Air Force, was speaker at a meeting of the Sedgwick County Society held in Wichita on February 7. His subject was "Research in Aviation Medicine." Before the meeting members of the society toured McConnell Air Force Base.

A meeting of the Shawnee County Society was held in Topeka on February 6. Dr. Francis T. Collins, vice-president of Kansas Blue Shield, discussed proposed changes in the Blue Shield plan with regard to income limits.

Dr. Don Davis, who discussed "Congenital Hypertrophic Pyloric Stenosis," was speaker at a meeting of the Wyandotte County Society on February 21.

Dr. Charles Fleckenstein, Onaga, is serving as president of the Pottawatomie County Medical Society this year and Dr. E. W. Christmann, Wamego, is secretary for 1956.

Members of the Labette County Society entertained the Auxiliary at a dinner meeting at the Parsons Country Club on February 8. Dan Aul, probate judge, was guest speaker.

Members of the societies in Harvey, McPherson, and Marion counties attended a meeting held at Halstead on February 6. Mr. Tom Jones, head of the department of visual education at the University of Chicago, discussed "Visual Education in Medicine."

Dr. Dennis A. Hardman was elected president of the Smith County Society at a meeting held recently at the home of Dr. Victor E. Watts, Smith Center. Other officers are: Dr. Lafe W. Bauer, vice-president; Dr. Watts, secretary, and Dr. Bauer, delegate to state meeting.

A meeting of the Allen County Society was held at the McAtee Rest Home, Iola, on February 14. Members of the Auxiliary were guests. The evening's discussion was devoted to geriatrics and the problem of nursing home care.

Dr. Lucius E. Eckles, Topeka pediatrician, was guest speaker at a meeting of the Riley County Society held at the Gillett Hotel, Manhattan, on Febru-

ary 15. His subject was "The Shifting Scene of Epidemic Disease."

The executive officers of the Kansas Medical Society, Mr. Oliver E. Ebel and Mr. Rueben M. Dalbec, were speakers at a meeting of the Cherokee County Medical Society held at Baxter Springs on February 21.

A special meeting of the Sedgwick County Society was held in Wichita on February 23. The guest speaker, Dr. Lloyd W. Reynolds, Hays, discussed "Past, Present and Future Policies of Blue Shield."

Make hotel reservations now for the annual meeting, Kansas Medical Society, Topeka, April 29-May 3, 1956.

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BOOK REVIEWS

Cardiovascular Surgery. Henry Ford Hospital International Symposium. Edited by Conrad R. Lam, M.D. Published by W. B. Saunders Company, Philadelphia. 543 pages, illustrated. Price \$12.75.

Cardiovascular Surgery is a compilation of the international symposium on that subject sponsored by the Henry Ford Hospital on March 17, 18, 19, 1955. This symposium was planned as an opportunity for outstanding leaders in the field from several countries to exchange ideas on recent studies on physiology, diagnosis, and techniques in the rapidly changing and advancing field. This necessarily involves discussion on new and controversial work, primarily of interest to those doing advanced surgery or diagnosis in the cardiovascular field.

The book is divided into 10 sections which cover diagnostic techniques, special physiology, specific heart lesions, cardiac arrest, hypothermia, and surgical disease of the major vessels.

In this day of rapid change in concepts and methods in cardiovascular surgery, such a symposium is a valuable summary of the thinking of many of the outstanding leaders in the field. At the same time it

must be remembered that many of the concepts and statements may have already changed in the minds of these participants as the book comes off the press. —R.M.B.

Cancer Cells. By E. V. Cowdry, M.D. Published by W. B. Saunders Company, Philadelphia. 677 pages, 137 figures. Price \$16.

The author presents the problem of cancer in a thoroughly clear, logical, and concise manner with a short but reliable discussion in all its aspects. He explains the cancer cell, why it is abnormal, and how it compares with a normal cell morphologically, physiologically, and chemically. He takes up the factors contributing to its development and its control and discusses its relation to a single trauma, virus, heredity, age, and research prospects.

There is an excellent bibliography available. The summaries given at the end of each chapter will appeal to many busy physicians. Illustrations are clear and well drawn.

The book can be recommended highly to all who are interested in a reliable survey of all aspects of the cancer problem and wish to have a dependable reference on cancer and its impact on man and society. —H.R.W.

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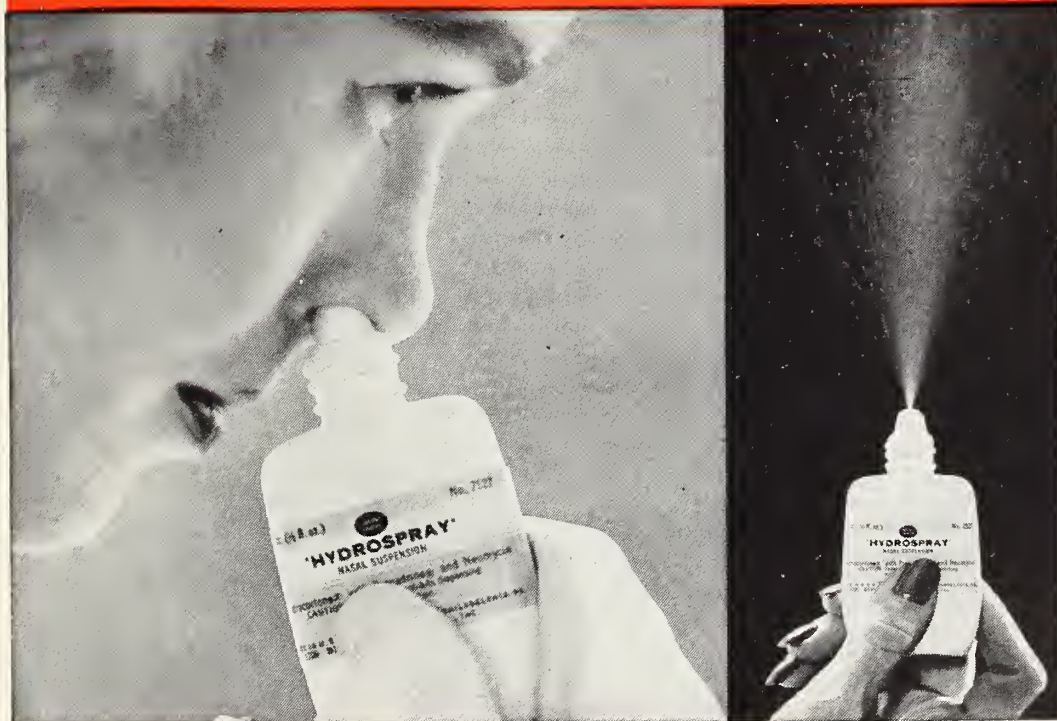
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REFERENCE: 1. Silcox, L. E., *A.M.A. Arch. Otolaryng.* 60:431, Oct. 1954.

Should the Patient Know the Truth? Edited by Samuel Standard, M.D., and Helmuth Nathan, M.D. Published by Springer Publishing Company, New York City. 158 pages. Price \$3.00.

This frequently asked question arises in many medical situations, involving not only medical but also social, moral, economic, and otherwise ethical aspects. The book records answers by physicians, nurses, clergymen, and lawyers in a most cogent fashion.

Among the living situations which are discussed, often with examples, are the cancer patient, curable and incurable, the "cardiac" patient, the seriously-ill child, the mother of a malformed infant or a stillborn fetus, the husband and wife who are infertile, the chronically ill patient, and the dying patient. These specific instances are cited so that their manner of management is exemplified and justified from different professional and theological points of view.

Throughout the book there is little quarrel with the basic premise that "honesty is the best policy." The discussion, and most of the philosophies, are concerned with the extent of factual information to impart to which patients. These circuitous philosophies regarding truth make for fascinating reading for all people who have wondered about psychologic reactions within the patient, within the family, and within the patient-doctor relationship. It is particu-

larly good reading for practicing physicians and nurses, the latter especially since they are so constantly and intimately bound to their patients. There is much food for thought and discussion in this short book.—S.R.F.

Cardiac Diagnosis: A Physiologic Approach. By Robert F. Rushmer, M.D. Published by W. B. Saunders Company, Philadelphia. 447 pages, illustrated. Price \$11.50.

The intent of this book, as expressed by the title, is well achieved. The present standard texts in cardiology, particularly White's, Levine's, and Freidberg's, are primarily an expression of the clinician's viewpoint (although Freidberg, more than the others, has a more physiological approach). Rushmer's book is definitely an expression of the opinion of the physiologist. As such, the man in practice will be disappointed if he expects to find here a system of therapy outlined. Such was not the author's intent.

The chief criticism that I would make is in the preponderance of reference to the author's own work. This is not meant to imply that his work is not valid, but the unilateral approach gives a false balance to the book: the title should be *Cardiac Diagnosis, the Physiologic Approach in My Laboratory*. —E.G.D.



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^{*}Krantz, J. C., Jr., and Carr, C. J.: The Pharmacologic Principles of Medical Practice, ed. 3, Baltimore, The Williams and Wilkins Company, 1954, p. 998.

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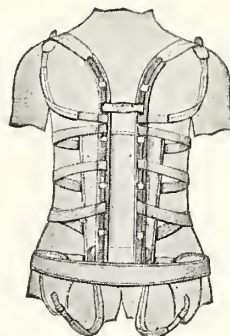
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ANNOUNCEMENTS

Scientific session and meeting, Southern Region of American College of Gastroenterology, Louisiana State University School of Medicine, New Orleans, Sunday, April 8. All physicians invited.

Course in gynecology and endocrinology given week of April 9 by Post-Graduate Medical School, New York University-Bellevue Medical Center.

Seminar in internal medicine and case demonstrations in specialties, April 9 through June 1, offered by Post-Graduate Medical School, New York University-Bellevue Medical Center. Class limited to 20. Tuition \$250. Physicians may take all or part. Subjects are allergy, cardiology, clinical hematology, clinical electrocardiography, physiology, problems in diagnosis, acute and chronic diseases of the chest, endocrinology, diseases of liver and biliary tract, gastroenterology, nephritis and hypertension, peripheral vascular disease. Write the Dean, 550 First Avenue, New York 3, New York.

Pan American Medical Association Congress, Mex-

ico City, April 15-21. Four days of scientific sessions, three days of sightseeing. Write the Director, 745 Fifth Avenue, New York.

Eighth annual meeting, Southwestern Surgical Congress, Pioneer Hotel, Tucson, April 16-18. Write the Congress, 207 Plaza Court Building, Oklahoma City 3, Oklahoma.

Thirty-seventh annual session, American College of Physicians, Los Angeles, April 16-20. Write the College, 4200 Pine Street, Philadelphia.

Eighth annual convention, International Academy of Proctology, Drake Hotel, Chicago, April 23-26. Write Secretary, 147 Sanford Avenue, Flushing 55, New York.

Course in regional anesthesia offered by New York University Post-Graduate Medical School, May 7-19. Course in neurological problems of general practice, April 30-May 5. Culdoscopy, April 30-May 4. Urology, May 14-25. Tuberculosis and other pulmonary diseases, June 4-8. Dermatology and syphilology, May 14-18. Orthopedics in general practice, June 11-13. Cardiology, three weeks beginning May

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7. Modern therapeutics in internal medicine, June 11-22. General medicine review, July 9-20. Write the Dean, 550 First Avenue, New York City.

Third National Cancer Conference, sponsored by American Cancer Society and National Cancer Institute, Detroit, June 4-6. Write ACS, 521 West 57th Street, New York 19, New York.

Next examination (Part II), oral and clinical, for candidates of the American Board of Obstetrics and Gynecology, Edgewater Beach Hotel, Chicago, May 11 through May 20. Notice of exact time to candidates by direct mail, also notice of eligibility for those who participated in Part I examinations.

Twelfth congress and graduate instructional course in allergy, New York City, April 15-20. Write American College of Allergists, Inc., 401 Marquette Bank Building, Minneapolis 2, Minnesota.

A.M.A. to Meet in Chicago

The 105th meeting of the American Medical Association will be held in Chicago, June 11-15, 1956. Headquarters for the House of Delegates will be at the Palmer House, and activities will be scheduled at

Navy Pier, Northwestern University, and near north side hotels.

Five days will be devoted to lectures, color television, and motion picture presentations to provide a short course in postgraduate education. There will be 350 technical exhibits and more than 300 scientific exhibits.

New Staff Appointees

The following new appointments to the staff of the University of Kansas School of Medicine were announced recently: Dr. David S. Dann, Kansas City, instructor in radiology; Dr. Sidney Rubin, Kansas City, instructor in radiology; Dr. William J. Reals, Wichita, lecturer in pathology, and Dr. Earl Sifers, Kansas City, assistant in surgery.

Mortality Rates

America's crude mortality rate has dropped an amazing 46 per cent since 1900—from 17.2 deaths per 1,000 population in 1900 to 9.2 in 1954—according to a bulletin recently released by Health Information Foundation.

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*Lawrence, W. E., Kahn, S. S., and Riser, A. B.:
South. M. J. 47:105, 1954.

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THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.

This Vaccine Mess

The layman, sensibly and logically, is inclined to leave matters of health to the experts. They include doctors, scientists and various government health men. For the most part they are trained, dedicated people who have the know-how and desire to render great public service.

For this reason, no layman is going to try to tell responsible government agencies and the medical profession in detail how the Salk polio vaccine pro-

gram should be handled. But, at the same time, every layman is conscious of the fact that it has been badly handled from the very top because of the doubts which have been raised and the confusion which has been created.

Two Southeast Kansas county medical associations are currently critical of the methods employed by the state in getting the vaccine to the children who need it. We are not about to try to side with either the associations or the state authorities, but it would seem that the people who are qualified to smooth out the program would do just that.

The real losers in all of the sharpshooting associated with the Salk program are the children who need the protection the vaccine provides.—*Coffeyville Daily Journal, January 22, 1956.*

A total of 3,342,599 babies were born in United States hospitals last year, a rise of 233,529 over the 1953 total, according to the American Hospital Association.

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TABLE OF CONTENTS

APRIL, 1956

Scientific Articles		Program of General Session	210
Lymphosarcoma—John G. Shellito, M.D., Wichita	199	Eye, Ear, Nose and Throat Program	213
True Knot in the Cord: Report of a Case Causing Fetal Death—J. S. Menaker, M.D., Wichita	202	Kansas Chapter, American Academy of Gen- eral Practice	214
Miscellaneous		Specialty Societies	215
97th Annual Session—Guest Speakers	204	Councilor Reports	221
Chronological Program	208	Committee Reports	226
		Blue Shield	260

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No. 4

Lymphosarcoma

Report of Three Cases in the Stomach with Outline of Treatment

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As early as 1913, lymphosarcoma was recognized as a gastric lesion.⁹ Primary malignant lymphomatous tumors of the stomach are rare. Lymphoid growths in the stomach comprise approximately 1 to 3 per cent of all malignancies of this organ.

M. B. Dockerty¹ in his course in surgical pathology has long taught that of the primary lymphoblastomas of the gastrointestinal tract, approximately 50 per cent will be in the stomach, 20 per cent will be in the small intestine, 20 per cent will be in the cecum, and 10 per cent will be in the remainder of the colon. Dockerty also feels that the prognosis is bad in the rectum, best in the cecum, and next best in the stomach. Approximately 30 per cent of all persons with lymphosarcomas of the gastrointestinal tract will be alive at the end of five years. This prognosis is approximately the same for adenocarcinoma of the stomach.

Jordan et al.³ have stated that pain is the most common symptom and may cause the lesion to be confused with peptic ulcer. Associated symptoms may also be weight loss, nausea and vomiting, hematemeses, and weakness. Morlock et al.⁷ have stated that the origin of the lymphoblastic tumor is in the lymphoid follicle of the gastric wall. The disease is spread by infiltration and ulcerates late. As in carcinoma of all kinds, there is no single sign which renders the diagnosis possible.

Morlock felt that because of the proximity of the tumor cells, and the submucous plexus of nerves, pain was a common feature and often an early one.

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There is no definite symptomatology associated with malignant lymphoma of the stomach.

The diagnosis can rarely be made prior to surgery.

Roentgenologic evidence may resemble benign gastric ulcer or adenocarcinoma of the stomach.

The treatment of choice is probably surgical extirpation of the lesion followed by x-ray therapy.

Such would be the circumstance in one of our cases (Case 3). Symptoms were thought to be vague and concern mainly belching, anorexia, loss of weight and strength. Pellicane et al.⁸ have described a patient with follicular lymphoblastoma of the stomach who, in common with many others, presented symptoms resembling those of duodenal ulcer. One of the cases here presented (Case 1) might be termed the opposite of an ulcer syndrome, in that the patient complained of indigestion and the laboratory reported anacidity. The other two patients gave histories which might have been interpreted as indicative of duodenal ulcer.

The diagnosis of lymphosarcoma or lymphoblastoma of the stomach is rarely made preoperatively. The determination of lymphosarcoma can be accomplished if the disease is generalized to the extent that it presents in some other location or organ.

In 1952, Shallenberger et al.¹⁰ reported a concurrent lymphoblastoma of the lung and stomach. The

lymphoma of the lung was reported as the primary lesion, following which the patient was found to have another lesion in the stomach. This further emphasizes the fact that the lymphomatous diseases are, on the whole, generalized.

There are no roentgenologic signs which are pathognomonic of lymphosarcoma. Because of its submucosal spread, in certain instances, lymphosarcoma may be confused with scirrhous carcinoma of the stomach. Marshall et al.⁶ in 1950, recommended radical surgery for this condition as they felt the diagnosis was not possible prior to extirpation of the lesion. These authors also recommended radiation therapy following resection, except in those instances in which a laparotomy and biopsy was the only surgery accomplished. In such patients radiation therapy was the treatment of choice.

MacCarty⁴ stated in 1943 that resections of the stomach, resulting from lymphosarcoma of that organ, were due to the surgeon's inability to distinguish these lesions from adenocarcinoma. It was felt then, that if a surgeon had his choice, probably a large portion of these lesions would best be treated by irradiation. This is not necessarily in agreement with Jordan et al.³ who have stated that surgical removal is the treatment of choice. Radiation is useful in inoperable patients since five-year survival is sometimes possible.

The incidence of lymphosarcoma of the stomach was reported by Ewing² as 1 per cent. However, higher incidences have been reported, such as that in 1950 of Marshall and Brown,⁶ who stated that one in every 30 gastric malignancies was of the lymphosarcoma group.

In 1952, Snoddy¹¹ presented 34 cases of lymphosarcoma of the stomach. He stated that exploratory laparotomy, biopsy, or gastric resection was definitely indicated, as clinical findings, roentgenologic diagnostic efforts, and gastroscopy could not adequately make a preoperative diagnosis. Snoddy also found a total of 474 cases of lymphosarcoma in the literature prior to his own 34. He felt that of this group 50 survived more than five years, giving a 10.5 per cent survival rate. Surgery alone, in 25, accounted for the cure. Radiation alone accounted for the cure of 13. A combination of the above was the treatment in the 12 remaining. Snoddy felt that the treatment of choice would certainly be surgery alone unless lymph nodes were microscopically involved, in which instance postoperative irradiation should be utilized.

The response of a lymphosarcoma to x-ray therapy has long been appreciated by roentgenologists and clinicians alike. If gastroscopy is done for a strange or unknown lesion of the stomach and biopsy proves the presence of a lymphosarcoma, x-ray therapy is

perhaps the best course to follow. However, such a lesion is usually diagnosed as carcinoma prior to surgical exploration and adequate biopsy. It is agreed by all that a therapeutic trial of x-ray therapy is not the best method with which to diagnose gastric carcinoma, or malignancy of any kind. The stand that all gastric lesions, whatever their appearance or whatever their symptoms, should be explored is not in question by the author.

CASE REPORTS

Case 1. Mr. W. M., 66454. This 71-year-old white male presented himself with loss of appetite and a feeling of indigestion. He had lost 15 pounds. His local doctor had discovered anacidity. He was given diluted hydrochloric acid to no avail. Antacids did not give relief. There was no vomiting and a slight amount of nausea. Histamine tests revealed no free acid in the stomach. X-ray films revealed a lesion in the fundus which was thought to be polypoid carcinoma (Figure 1).

The patient was hospitalized and a total gastrectomy was done. A lymphoma was found by the



Figure 1. X-ray revealing a lesion in the fundus thought to be polypoid carcinoma.

pathologist to extend throughout the submucosal area of the entire stomach.

The patient was given intensive x-ray therapy following surgery with good relief. He died eight months postoperatively.

Case 2. Mrs. N. P., 76033. This 50-year-old white female presented herself with difficulty in swallowing, of a questionable 2½ years duration. She stated that she could swallow liquids and soft foods without difficulty, but anything with any bulk "stuck in her throat." She would occasionally have regurgitant symptoms and attempt to vomit. The patient felt that food did not reach her stomach, although she swallowed it as best she could. She admitted a 24-pound weight loss during the past few months. She had had long hair in her early life and had used her mouth for an extra hand while braiding it.

The x-ray report was that of a filling defect on the posterior wall of the stomach, possibility of a bezoar. It was with this thought in mind that the patient was explored.

A large tumor was found on the posterior surface of the stomach. Invasion was reported into the retroperitoneal structures, pancreas, and curve of the duodenum. Because of the extensive involvement, no surgery was done other than a biopsy. X-ray therapy was utilized as the treatment of choice.

Pathological diagnosis was lymphosarcoma, serosal surface, lesser curvature, stomach.

The patient, seen one year and six months later, is doing well.

Case 3. Mrs. G. B., 7481. This 74-year-old white female presented herself with the complaints of loss of appetite, pain in the left upper quadrant, and nausea of three weeks duration. An unexplicable loss of weight was associated with vague pain in the upper abdomen when the stomach was empty. The

pain was relieved somewhat by milk and made worse by fruit juice. The above was associated with a weight loss of 10 pounds in three weeks.

No masses were palpated in the abdomen. Gastros-copy revealed an infiltrative lesion in the submucosa of the stomach. Surgery revealed a large tumorous mass in the distal three-fourths of the stomach and many enlarged regional nodes. The surgeon felt that the lesion was probably a lymphoma. An almost complete gastrectomy was done.

The patient did poorly in the postoperative period and died of cardiac failure 11 days after surgery. Pathologic report was malignant lymphoma, lymphoblastic type, stomach.

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In matters scientific, all is well, and men and women in medicine are for the most part highly respected. But in matters pertaining to the socio-economic problems of medicine all is not well. Leadership in matters of health is being challenged constantly. Naturally, in a competitive society as we have in America, other groups, especially those with high pressure leanings, will absorb this leadership if the medical profession is not vigilant of its responsibilities every day of the year.

—F. J. L. Blasingame, M.D., *Trustee*
American Medical Association

True Knot in the Cord

Report of a Case Causing Fetal Death

J. S. MENAKER, M.D., *Wichita*

In the practice of obstetrics, we are all striving for the only perfect answer, a healthy, happy mother and a normal, healthy child in every case. In the vast majority of our cases today, we are able to achieve that goal simply by adherence to contemporary concepts of good prenatal care and conservative management at delivery. That is one of the reasons the practice of obstetrics is such a pleasant specialty, even though the uncertainty and irregularity of our hours is the standard butt of medical humor. The once dreaded spectre of maternal death has become so minimized by the giant strides of modern medicine that many men may now practice their whole lives without experiencing a maternal death in their own private practices.

Our results with fetal salvage have not been so spectacular, although here too we are making inroads into what were formerly considered irreducible percentages of fetal loss. Once in a great while, however, one is faced with a rare and unpredictable cause of fetal death which not only surprises but frustrates the obstetrician because it is as unpreventable as it is unpredictable. Such a complication is intrapartum fetal asphyxiation due to a true knot in the umbilical cord.

The occurrence of fetal asphyxia from a true knot in the fetal cord is certainly rare. Four of our colleagues with an aggregate of more than 1,000 deliveries had never met with this complication as a cause of fetal death. However, the true incidence is difficult to calculate. Surely all of us have seen a simple knot as the result of this trick of the agile fetus but have paid no attention to it other than to remark upon its presence to the house staff, medical students, and especially the nurses who usually express delight and surprise.

Certainly it never occurred to us to record the number of true knots, for the frequency of such occurrence was considered to be another of those "little facts not worth knowing." A recent case, however, in which a true knot in the cord became so tightly closed that it caused fetal death from intrapartum asphyxia, was enough of a jolt to send us hurrying to the literature to learn more of this complication.

Standard textbooks mention the complication as a cause of fetal death briefly if at all. There is, how-

The phenomenon of the true knot in the umbilical cord is reviewed with special emphasis upon this abnormality as a cause of fetal death.

An additional case in which a true knot in the umbilical cord caused intrapartum fetal asphyxia and death is reported.

ever, a wealth of articles in fairly recent medical writings as well as older references in the writings of Baudelocque and Von Winckel.⁸ Hennessey,³ in 1944, wrote an excellent review of the literature to that date from which he culled 25 reported cases of true knots, to which he added seven cases. In 14 of these cases the knot caused fetal death. In 10 of these the deaths occurred from labor.³

Peterson⁶ reported a case in 1952 in which he noted extremely vigorous movement followed by cessation of movement. He described the knot as being "degenerated," most notable on the fetal side of the cord. However, he did not record any measurements of cord diameter proximally and distally to the knot. In this same year Javert and Barton⁴ reported 1,000 cases of abortion caused by congenital and acquired lesions of the cord, but in only one of these was a true knot believed to be the cause of death.

In a condition which is so infrequent, one wonders why it occurs at all. Surely it must require an acrobatic fetus, still small enough to have room to maneuver about in the amniotic sac. Von Winckel, in his text published in 1889, stated that two conditions must be present in order for a true knot to be formed: The cord must be two times as large as the distance from the umbilicus to the vertex, and there must be sufficient *liquor amnii* to insure complete mobility of the fetus.

Brroune,¹ in 1925, quoted Baudelocque as opining that it was extremely unlikely for a knot in the cord to become tight enough to cause asphyxia prior to labor because the pulsations of the cord could, theoretically, unwind the loop of the knot. He also called attention to the fact that the fetus was "free swimming" in the amniotic fluid and had no point of fixation from which to pull the knot sufficiently taut to cause asphyxia prior to labor.

Reynolds,⁷ in a scholarly study of pressures in um-

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bilical cord vessels and hemodynamics of fetal circulation, would give some plausibility to Baudelocque's theory that the pressure in the cord and its pulsations would prevent tightening of the knot; yet it is well documented that such a strangling closure of the knot can and does occur.

Broune devised several experiments to show that such tightening was possible by the weight and movements of the fetus. This possibility was shown to be enhanced if the cord was looped around the body or small parts of the fetus. Javert, Barton,⁴ and McNally⁵ each made references to this last point, and their articles contain excellent photographs which illustrate it.

Flemming² describes a normal newborn where the cord contained two knots, one a figure-of-eight, the other a single knot, both loosely tied. I, myself, delivered such a case with two similar knots but with no sign of fetal distress during the antepartum course or during labor and delivery.

The case reported here occurred in a 25-year-old gravida II para I who had an uneventful prenatal course and delivery in her first pregnancy. The estimated date of confinement was February 2, 1955. The prenatal course was in no way remarkable except for the fact that after the 34th week the patient complained at every visit of the painful activity of the baby. She described its frenetic movements as being so intense as to cause acute pain sufficient to interfere with her rest at night. This vigorous activity was indeed easy to demonstrate objectively, for at each antepartum visit in the last two months such lively movements were felt that we attempted to cover up with whimsey our inability to explain away the baby's hyperactivity. Lacking a more definitive treatment for the patient's complaints, we dismissed them with a remark, "It is either a rhumba dancer or a football player," and a prescription for a mild soporific so the mother might get some rest.

On January 27, 1955, fetal movements were again hyperactive, but the fetal heart was strong and steady at a rate of 144 per minute. On the next prenatal visit, February 3, the fetal heart was not heard, al-

though the patient did describe fetal movements "like the baby was shifting his weight around."

In the late evening of February 5, 1955, the patient went into active labor. We met her at the hospital but careful examination did not reveal the presence of a fetal heart beat. Labor was normal and progressed rapidly under sedation, Meperidine, 100 milligrams, and scopolamine, gr. 1/150. When the patient was 7 centimeters dilated, the membranes ruptured with a rush of dark brown meconium stained fluid. Three grains of sodium phenobarbital was administered intravenously, and the patient was taken to the delivery room where she promptly delivered a macerated female stillborn infant. About midway in the cord there was a true knot, tightly drawn. The portion of the cord proximal to the placenta was obviously larger than the portion distal to the knot. This distal segment on the fetal side of the knot was collapsed and had a florid reddish color, while the proximal segment was a more normal bluish color.

The third stage of labor progressed quickly, the placenta being gently expressed by Broune's maneuver. The placenta looked grossly normal with a few small infarcts. The insertion of the cord was eccentric.

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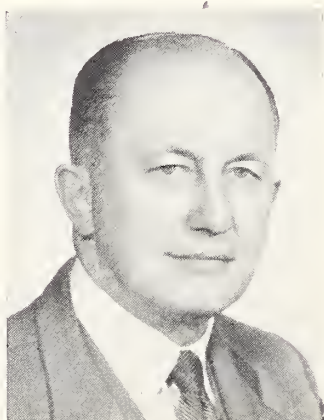
Material science now has the clear possibility and promise of the systemic utilization of all the natural resources of the earth for the good of the whole human race. . . . Maintaining and improving the standard of living of all the peoples of the earth through increasing use of mechanical horse power and the scientific approach is now one of the keys to peace in the world.

—Charles E. Wilson

97th Annual Session, Kansas Medical Society

*Sunday, April 29, through Thursday, May 3
Topeka, Kansas*

GUEST SPEAKERS



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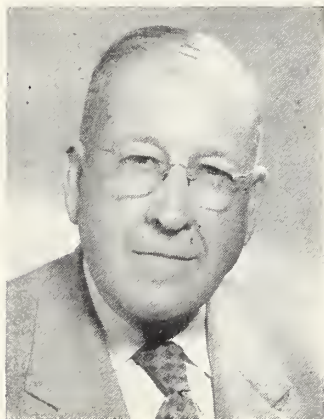
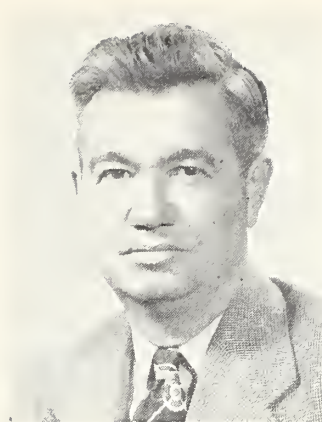


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Specialty: General Practice.

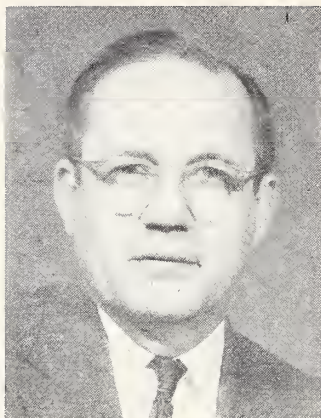
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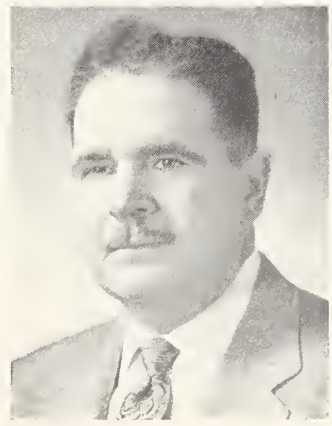
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Chronological Program

Listing of Events, Sunday, April 29 through Thursday, May 3, 1956

Sunday, April 29

- 9:00 Kansas Medical Assistants' Society. See Page 219
- 12:15 Annual Meeting and Luncheon, Blue Shield Board of Directors
Blue Cross-Blue Shield Building, 1133 Topeka Boulevard
- 1:30 Kansas Orthopedic Club. See Page 215

Monday, April 30

- 9:00 Kansas Chapter, American Academy of General Practice. See Page 214
- 10:00 Practice Rounds, Kansas Medical Golfing Association
Topeka Country Club, 27th and Buchanan Streets
- 10:00 Practice Trap Shooting, Kansas Medical Skeet and Trapshooting Association
Topeka Gun Club, Six Miles East of Topeka on Highway 40, North Side of Highway
- 1:00 Competitive Golfing, Kansas Medical Golfing Association
Topeka Country Club, 27th and Buchanan Streets
- 1:00 Competitive Trap Shooting, Kansas Medical Skeet and Trapshooting Association
Topeka Gun Club, Six Miles East of Topeka on Highway 40, North Side of Highway
- 6:00 Cocktails, followed by Tournament Banquet and Awarding of Prizes
Topeka Country Club, 27th and Buchanan Streets
- 8:00 Kansas Association of Clinic Managers. See Page 218

Tuesday, May 1

- 7:30 K. U. Alumni Breakfast
Hotel Jayhawk, Coffee Shop Round Table
- 8:30 Registration for General and EENT Scientific Sessions. See Pages 210 and 213
- 9:00 Woman's Auxiliary to Kansas Medical Society. See Page 218
- 12:15 Meeting of Editorial Board, Journal of Kansas Medical Society
Hotel Jayhawk
- 6:30 House of Delegates Dinner and Meeting
Florentine Room, Jayhawk Hotel

Wednesday, May 2

- 8:30 Registration for General and EENT Scientific Sessions. See Pages 211 and 213
- 7:00 Annual Banquet
Topeka Country Club, 27th and Buchanan Streets

Thursday, May 3

- 8:30 Registration for Specialty Society Meetings at Municipal Auditorium
- Anesthesiology—See Page 214
Chest Medicine—See Page 215
Pathology—See Page 216
Pediatrics—See Page 216
Psychiatry—See Page 216
Radiology—See Page 217
Surgery—See Page 217
Urology—See Page 217
- 12:30 House of Delegates Luncheon and Meeting
Roof Garden, Jayhawk Hotel

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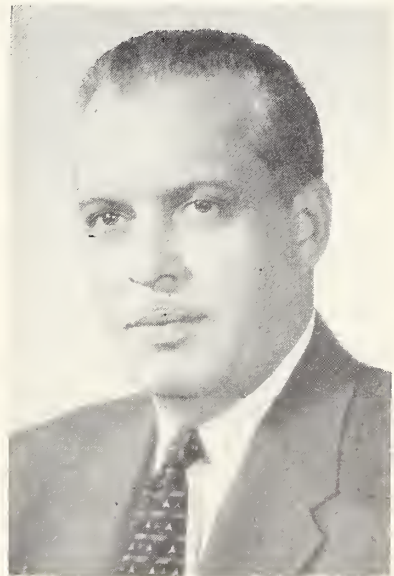
Conrad M. Barnes, M.D., *President*

Conrad M. Barnes, M.D., President, Kansas Medical Society, September 5, 1955, to May 3, 1956; Graduate, University of Kansas School of Medicine, 1936. Offices and Activities: Second President of Kansas Blue Shield; President-Elect of Kansas Chapter of American Academy of General Practice; First Chairman, Committee on Rural Health of Kansas Medical Society; Featured Speaker, National Rural Health Conference. Accomplishments during Presidency: Appeared before Senate Committee on Finance, Washington, D.C., February 23, to Discuss H.R. 7225; Conducted County Medical Society Conference, February 26; Represented Kansas at National Rural Health Conference, Portland, Oregon, March 8-9; Conducted Kansas Medical Day at University of Kansas School of Medicine, Kansas City, March 12; Appointed New Committee on School Health, Special Committee on Polio Vaccine, Special Committee on Medical Practice Act.

In Memoriam

JOHN M. PORTER, M.D.
President, Kansas Medical Society
May 5, 1955 to September 5, 1955

Clyde W. Miller, M.D., to Take Office as President, Kansas Medical Society, May 3, 1956; Graduate, University of Louisville School of Medicine, 1936; in Private Practice in Wichita since 1937, except during World War II while Serving Overseas with Army Medical Corps; First President, Kansas Chapter of American Academy of General Practice; First Chairman of Committee on Public Relations of Kansas Medical Society; Active Member of Numerous Society Committees; General Chairman of a Former Annual Session of Kansas Medical Society.



Clyde W. Miller, M.D., *President-Elect*

Program of General Session

Tuesday, May 1

Municipal Auditorium, South Entrance

Morning

8:30 Registration

FIRST SESSION

CHARLES S. JOSS, M.D., Topeka, *Presiding*

9:45 ADDRESS OF WELCOME

Clyde B. Trees, M.D., Topeka
President, Shawnee County Medical
Society

10:00 SOCIO-ECONOMIC PROBLEMS OF THE A.M.A.

Dwight H. Murray, M.D., Napa

10:35 Intermission to Visit Exhibits

SECOND SESSION

CYRIL V. BLACK, M.D., Pratt, *Presiding*

10:50 THE PROGRAM AND OBJECTIVES OF THE
JOINT COMMISSION ON ACCREDITATION
OF HOSPITALS

Kenneth B. Babcock, M.D., Chicago

11:25 LOOK WHAT'S HAPPENING TO MEDICAL
PRACTICE!

William Alan Richardson, Oradell

Afternoon

THIRD SESSION

VERNON E. WILSON, M.D., Kansas City, *Presiding*

2:00 PANEL DISCUSSION: WHERE DO WE GO
FROM HERE?

William Alan Richardson, Oradell, *Moderator*

Participants:

Kenneth B. Babcock, M.D., Chicago

Dwight H. Murray, M.D., Napa

Donald P. Trees, M.D., Wichita

Evening

6:30 House of Delegates Dinner and Meeting
Florentine Room, Jayhawk Hotel

Telephone Number for Annual Meeting in Topeka, 5-2383

Program of General Session

Wednesday, May 2
Municipal Auditorium, South Entrance

Morning

8:30 Registration

FOURTH SESSION

D. BERNARD FOSTER, M.D., Topeka, *Presiding*

9:30 **GASTROINTESTINAL PROBLEMS IN THE AGED**
Manuel Sklar, M.D., Chicago

10:05 **INDUCTION OF LABOR**
William C. Keettel, M.D., Iowa City

10:40 Intermission to Visit Exhibits

FIFTH SESSION

J. PHILIP BERGER, M.D., Wichita, *Presiding*

10:55 **SELECTION OF OPERATIONS FOR CARCINOMA
OF THE MIDTRANSVERSE COLON TO REC-
TUM INCLUSIVE**
Peter A. Rosi, M.D., Chicago

11:30 **SEVERE TOXIC REACTIONS TO INTRAVENOUS
CONTRAST MEDIA: CAUSE AND CONTROL**
Philip J. Hodes, M.D., Philadelphia

Afternoon

SIXTH SESSION

CLYDE B. TREES, M.D., Topeka, *Presiding*

2:00 **PHYSIOLOGICAL CHANGES IN EVERYDAY
ANESTHESIA**

O. Sidney Orth, M.D., Madison

2:35 Intermission to Visit Exhibits

2:50 **PANEL DISCUSSION: ACUTE ABDOMINAL
PAIN**
Orville R. Clark, M.D., Topeka, *Moderator*

Participants:

Philip J. Hodes, M.D., Philadelphia
William C. Keettel, M.D., Iowa City
O. Sidney Orth, M.D., Madison
Peter A. Rosi, M.D., Chicago
Manuel Sklar, M.D., Chicago

Evening

7:00 Annual Banquet, Entertainment and
Dance

Telephone Number for Annual Meeting in Topeka, 5-2383

Program of General Session

Thursday, May 3

Municipal Auditorium, South Entrance

Morning

8:30 Registration

Programs to be presented by specialty societies. See Page 208

12:30 House of Delegates Luncheon and Meeting

Roof Garden, Jayhawk Hotel

Technical Exhibits

1. Doho Chemical Corporation
2. National Livestock and Meat Board
4. Goetze-Niemer Company
6. Carroll Dunham Smith
7. Ethicon Suture Laboratories, Inc.
8. Soundscriber Corporation
9. and 10. Munns Medical Supply Company
11. Ciba Pharmaceutical Products, Inc.
14. Ayerst Laboratories
16. E. R. Squibb and Sons
17. Julius Schmid, Inc.
18. Sharp and Dohme, Inc.
19. Mead Johnson and Company
20. Washington National Insurance Company
21. Eli Lilly and Company
22. Ortho Pharmaceutical Corporation
23. A. H. Robins Company, Inc.
24. Encyclopedia Americana
25. and 26. Mid-West Surgical Supply Company
27. Medical Protective Company
28. American Optical Company
29. J. B. Lippincott Company
30. Coe Surgical Supply Company
31. Pet Milk Company
32. Parke, Davis and Company
34. General Electric X-ray Corporation
38. United Medical Equipment Company
39. Borden Company, Prescription Products Division
40. Hoffman-LaRoche, Inc.
41. Lederle Laboratories Division, American Cyanamid Company
42. Coufal-Keleket X-ray Company
44. Abbott Laboratories
45. A. S. Aloe Company
46. J. B. Roerig and Company
47. The William S. Merrell Company
48. C. B. Fleet Company, Inc.
49. Schering Corporation
50. C. Ray Tyler Agency
51. Burroughs Wellcome and Company, Inc.
52. H. G. Fischer and Company
53. William P. Poythress and Company, Inc.
54. Thomas A. Edison, Inc.
55. Blue Line Chemical Company
57. Pfizer Laboratories
58. Kansas Blue Cross-Blue Shield
59. Winthrop-Stearns, Inc.
60. M and R Laboratories
61. The Baker Laboratories, Inc.
62. Greb X-ray Company
63. Sealy Mattress Company
64. U. S. Vitamin Corporation
65. W. B. Saunders Company
66. The Purdue Frederick Company
67. G. D. Searle and Company
68. Audio-Digest Foundation
70. Coca-Cola Company

Telephone Number for Annual Meeting in Topeka, 5-2383

Eye, Ear, Nose and Throat Program

*Tuesday, May 1, and
Wednesday, May 2*

Tuesday Morning, May 1

8:30 Registration

FIRST SESSION

DAVID P. TRIMBLE, M.D., Emporia, *Presiding*

9:30 MODERN APPROACHES TO RETINAL DETACHMENT SURGERY

Lawrence T. Post, Jr., M.D., St. Louis

10:30 Intermission to Visit Exhibits

SECOND SESSION

PAUL GUGGENHEIM, M.D., Topeka, *Presiding*

11:00 PRESENT DAY STATUS OF TREATMENT OF CANCER OF THE LARYNX

Joseph H. Ogura, M.D., St. Louis

Tuesday Afternoon, May 1

THIRD SESSION

MAX S. LAKE, M.D., Salina, *Presiding*

2:00 TONOGRAPHY—PART I.

Lawrence T. Post, Jr., M.D., St. Louis

3:00 Intermission to Visit Exhibits

FOURTH SESSION

RALPH R. PRESTON, M.D., Topeka, *Presiding*

3:15 DECOMPRESSION OPERATION FOR MALIGNANT EXOPHTHALMOS

Joseph H. Ogura, M.D., St. Louis

4:15 Meeting of EENT Section

5:15 Cocktail Party, Topeka Country Club, for Members of EENT Section and Their Wives

Wednesday Morning, May 2

8:30 Registration

FIFTH SESSION

JAMES E. HILL, M.D., Arkansas City, *Presiding*

9:30 BILATERAL SEPTOPERIOSTEAL FLAP OPERATION FOR FRONTAL SINUSITIS

Joseph H. Ogura, M.D., St. Louis

10:30 Intermission to Visit Exhibits

SIXTH SESSION

JAMES H. ENNS, M.D., Newton, *Presiding*

11:00 TONOGRAPHY—PART II

Lawrence T. Post, Jr., M.D., St. Louis

Wednesday Afternoon, May 2

SEVENTH SESSION

G. O'NEIL PROUD, M.D., Kansas City, *Presiding*

2:00 SEPTAL AND NASAL RECONSTRUCTION: ITS PHYSIOLOGICAL IMPLICATIONS

Joseph H. Ogura, M.D., St. Louis

3:00 Intermission to Visit Exhibits

EIGHTH SESSION

DONALD O. HOWARD, M.D., Wichita, *Presiding*

3:15 EXPERIENCES WITH DIAMOX

Lawrence T. Post, Jr., M.D., St. Louis

Telephone Number for Annual Meeting in Topeka, 5-2383

Kansas Chapter, American Academy of General Practice

Monday, April 30, 1956
Jayhawk Hotel, Topeka

9:00 Registration on Second Floor

10:00 Business Meeting
Green Room on Second Floor

LAWRENCE E. LEIGH, M.D., Overland Park, President
Kansas Chapter, American Academy of General
Practice, *Presiding*

12:15 Luncheon
Green Room on Second Floor

Clinicopathological Conference moder-
ated by Victor B. Buhler, M.D., Kan-
sas City, Missouri, Pathologist at Provi-
dence and St. Margaret's Hospitals,
Kansas City, and President, Missouri
State Medical Society

Scientific Program

Florentine Room, West End of Lobby

2:00 CONSERVATIVE TREATMENT OF LOW BACK
PAIN

Paul C. Williams, M.D., Dallas

2:30 A YOUNG DOCTOR OF THE OLD SCHOOL
Wyatt Norvell, M.D., New Castle, Ky.

3:00 Intermission

3:15 CONSERVATIVE TREATMENT OF CERVICAL
PAIN

Paul C. Williams, M.D., Dallas

3:45 ROUND TABLE DISCUSSION

Lawrence E. Leigh, M.D., Overland
Park, *Presiding*
Wyatt Norvell, M.D., New Castle, Ky.
Paul C. Williams, M.D., Dallas

Evening Program

6:00 Cocktail Hour, Roof Garden

7:00 DINNER, ROOF GARDEN
Guest Speaker: Mr. Orville Roberts, Pub-
lic Relations Consultant, Sinclair Pipe
Line Company, Independence

10:00 Dance to Music of Dean Fleming Orches-
tra

ANESTHESIOLOGY

Sponsored by Kansas Society of Anesthesiology

Thursday, May 3, 1956

9:30 Program to Be Announced

Telephone Number for Annual Meeting in Topeka, 5-2383

CHEST MEDICINE

Sponsored by Kansas Chapter of American College
of Chest Physicians

Thursday, May 3, 1956

Morning

IN SUNG KWAK, M.D., Topeka, *Presiding*

10:00 INDICATIONS FOR PULMONARY RESECTION
John G. Shellito, M.D., Wichita

HEMODYNAMICS OF PULMONARY CIRCULATION
James Dowell, M.D., Kansas City

THE PROBLEM OF THE TREATMENT OF THE
TUBERCULIN CONVERTOR
Joseph B. Stocklen, M.D., Cleveland

GENERALIZED TUBERCULOSIS AND HISTOPLASMOSIS
George Post, M.D., Wadsworth

TUBERCULOSIS SURVEY IN KANSAS: A PRELIMINARY REPORT

Joseph B. Stocklen, M.D., Cleveland

PULMONARY TUBERCULOSIS AND MALIGNANCY

Albert B. Jackson, M.D., Wadsworth

SERUM TRANSAMINASE

Samuel Zelman, M.D., Topeka

PANEL DISCUSSION: TREATMENT OF TRAUMATIC INJURIES OF THE CHEST, Robert M. Brooker, M.D., Topeka, *Moderator*

Participants:

Arthur L. Ashmore, M.D., Wichita

Ben H. Buck, Jr., M.D., Wichita

Evening

6:00 Social Hour

7:00 Dinner and Election of Officers

SALT

George R. Meneely, Nashville, Tennessee

ORTHOPEDICS

Sponsored by Kansas Orthopedic Club

Sunday, April 29, 1956

1:30 Business Session
Hotel Jayhawk

2:30 SURGERY OF THE LUMBO-SACRAL SPINE
Paul C. Williams, M.D., Dallas

3:30 PROBLEMS OF THE KANSAS CRIPPLED CHILDREN'S COMMISSION

Mr. L. M. Vanece, Wichita

5:00 Cocktail Party for Members and Their Wives
Topeka Country Club, 27th and Buchanan Streets

Telephone Number for Annual Meeting in Topeka, 5-2383

PATHOLOGY

Sponsored by Kansas Society of Pathologists

Thursday, May 3, 1956

9:30 Program to Be Announced

PEDIATRICS

Sponsored by Kansas State Pediatric Society

Thursday, May 3, 1956

9:30 PANEL DISCUSSION ON HEARING CONSERVATION, Hilbert P. Jubelt, M.D., Manhattan, Moderator

Participants:

Robert E. Roach, Ph.D., Director of Audiology, Institute of Logopedics, Wichita

G. O'Neil Proud, M.D., Head, Department of Otolaryngology, University of Kansas Medical Center, Kansas City

Charles T. Hinshaw, M.D., Pediatrician, Wichita

Frederick Speer, M.D., Pediatric Allergist, Kansas City

12:00 Luncheon and Business Session at Jayhawk Hotel

1:00 PANEL DISCUSSION ON PEDIATRIC ORTHOPEDICS, Bertrand I. Krehbiel, M.D., Topeka, Moderator

Participants:

William F. McGuire, M.D., Pediatrician, Wichita

Clyde B. Trees, M.D., Orthopedist, Topeka

Donald L. Rose, M.D., Director, Department of Physical Medicine, University of Kansas Medical Center, Kansas City

PSYCHIATRY

Sponsored by Kansas Psychiatric Society

Thursday, May 3, 1956

Program Starting at 10:00 a.m.

**FAILURES IN PSYCHIATRIC TREATMENT
John A. Grimshaw, M.D., Topeka**

**BASIC CONCEPT OF PSYCHIATRIC TREATMENT
F. Carter Newsom, M.D., Wichita**

**CONFLICT IN THE NATURE OF DEFENSES AND
EXPERIMENTAL STUDY
Ann Neel, Ph.D., Kansas City**

**EPILEPSY, NEUROLOGY, AND NEUROSURGICAL CONDITIONS
John A. Segerson, M.D., Topeka**

Telephone Number for Annual Meeting in Topeka, 5-2383

RADIOLOGY

Sponsored by Kansas Radiological Society

Thursday, May 3, 1956

9:00 Breakfast and Business Meeting
Hotel Jayhawk, Rose Room

SURGERY

Sponsored by Kansas Chapter of American College of Surgeons

Thursday, May 3, 1956

9:00 THE MAINTENANCE OF VENTILATORY FUNCTION FOLLOWING INJURY

Frank F. Allbritten, Jr., M.D., Kansas City

9:15 THE INDICATIONS, METHODS, AND PURPOSES OF EMERGENCY CRANIOTOMY FOR THE PATIENT WITH CRANIAL INJURY

William P. Williamson, M.D., Kansas City

9:30 THE EMERGENCY AND EARLY MANAGEMENT OF THE PATIENT WITH SPINAL CORD INJURY

Charles E. Brackett, Jr., M.D., Kansas City

9:45 INITIAL AND SUPPORTIVE CARE OF THE PATIENT WITH ACUTE DISEASE OR INJURY OF THE GENITOURINARY SYSTEM

William L. Valk, M.D., Kansas City

10:00 THE EMERGENCY TREATMENT OF THE PATIENT WITH INJURY OR ACUTE CHANGE IN A PERIPHERAL ARTERY

Creighton A. Hardin, M.D., Kansas City

10:15 THE EARLY CARE OF THE PATIENT WITH AN OPEN FRACTURE RELATED TO THE FUNCTIONAL RESULT

Lynn O. Litton, M.D., Kansas City

10:30 Intermission

10:45 THE EMERGENCY CARE OF THE PATIENT WITH INTERNAL BLEEDING FOLLOWING INJURY

Stanley R. Friesen, M.D., Kansas City

11:00 THE MANAGEMENT OF THE PATIENT WITH ACUTE CARDIAC ARREST

C. Frederiek Kittle, M.D., Kansas City

11:15 THE EMERGENCY CARE INDICATED IN THE TREATMENT OF THE PATIENT WITH AN INJURED HAND

Richard C. Ye, M.D., Kansas City

11:30 THE PROGNOSIS OF THE BURNED PATIENT RELATED TO THE INITIAL CARE

David W. Robinson, M.D., Kansas City

UROLOGY

Thursday, May 3, 1956

9:30 Business Meeting to Discuss Organization Plans

CLINIC MANAGERS

Sponsored by Kansas Association of Clinic Managers

Kansas Hotel, Topeka

Monday, April 30, and Tuesday, May 1

Monday, April 30

8:00 Round Table Discussion of Clinic Problems
Social Hour

Tuesday, May 1

MR. JOHN M. LOCHRIDGE, Newton, *Presiding*
General Session in Roof Lounge

9:00 WELCOME TO TOPEKA

Mr. G. R. Umbarger, Topeka,
Manager, Topeka Medical Center
Introduction of Guests and Members
Appointment of Nominating Committee

Distribution of Kansas Clinic Managers' Directory

Mr. Will Birthelmer, Wichita
Assistant Manager, Wichita Clinic

9:45 Symposium: Methods of Salary Determination and Control of Employees

10:45 Coffee Break

11:00 Symposium: Methods of Handling Delinquent Accounts

12:00 Luncheon
Brief Business Session

2:00 Panel Discussion at Municipal Auditorium as Guests of Kansas Medical Society

Woman's Auxiliary to the Kansas Medical Society

April 30, May 1, May 2, 1956
Topeka, Kansas

Monday, April 30

1:00-4:00 Registration
Municipal Auditorium and Hotel Jayhawk

Tuesday, May 1

9:00-4:00 Registration
Municipal Auditorium and Hotel Jayhawk

9:00 Pre-Convention Board of Directors Meeting
Conference Room, Stormont-Vail Hospital
Transportation provided from Jackson Street Entrance of Hotel Jayhawk

11:30 Brunch honoring Mrs. Mason Lawson, National President
Topeka Country Club
Transportation provided from Jackson Street Entrance of Hotel Jayhawk

7:00 Past State Presidents' Dinner
Green Room, Hotel Jayhawk

Wednesday, May 2

9:00-12:00 Registration
Municipal Auditorium and Hotel Jayhawk

9:00 General Session
Conference Room, Stormont-Vail Hospital
Transportation provided from Jackson Street Entrance of Hotel Jayhawk

1:00 Luncheon honoring State Officers
Roof Garden, Hotel Jayhawk

3:30 Post-Convention Board of Directors Meeting
Hotel Jayhawk

7:00 Annual Kansas Medical Society Banquet
Topeka Country Club

Kansas Medical Assistants' Society

16th Annual Meeting Kansan Hotel, Topeka

Saturday Evening, April 28

7:00 Past Presidents' Meeting

8:00 Entertainment
See Hotel Bulletin Board

Sunday, April 29

9:00-11:00 Registration. Coffee Hour

9:00 Executive Board Meeting

12:00 President's Luncheon

1:30 ADDRESS OF WELCOME
Dwight Lawson, M.D., Topeka, Vice-
President, Shawnee County Medical
Society

1:40 GREETINGS
Conrad M. Barnes, M.D., Seneca,
President, Kansas Medical Society

1:50 RESPONSE
Mrs. Pauline Keller, Topeka, President
Kansas Medical Assistants' Society

2:00 THE LARGER PERSPECTIVE
Thomas P. Butcher, M.D., Emporia

3:00 Business session and Election of Officers

3:45 Blue Cross-Blue Shield Discussion Period

4:00 Meeting of 1956-1957 Officers and Coun-
cilors

6:30 Dinner and Entertainment
Impersonations by Tom Sawyer
Music by Forrest Slaughter Ensemble
Skit by Shawnee County Medical Assist-
ants' Society

Monday, April 30

9:30 ANNOUNCEMENTS
Mrs. Pauline Keller, Topeka

9:40 GREETINGS
Miss Janice Pfcffer, Topeka, President
Shawnee County Medical Assistants'
Society

9:45 LEADING A DOUBLE LIFE
Patricia T. Schloesser, M.D., Topeka,
Pediatric Consultant, Kansas State
Board of Health

10:15 NARCOTIC LAWS AND REGULATIONS
Mr. George F. Shattuck, Kansas City,
Missouri, Agent, Bureau of Narcotics,
Treasury Department

10:45 HEART SURGERY
Robert M. Brooker, M.D., Topeka

12:30 Luncheon and Program
WHY LIBRARIES?
Mr. Horace Moses, Topeka,
Librarian, City Library

2:30 Installation of Officers

3:00 Viewing of Exhibits at Municipal Audi-
torium

Telephone Number for Annual Meeting in Topeka, 5-2383

PRESIDENT'S PAGE

DEAR DOCTOR:

This is the time of the year when "The voice of the turtle is heard throughout the land." Certain swans also sing their song. This orients us with the fact that this will be my last official letter to you. Clyde Miller will be writing you the next one.

You will agree, I believe, that this has been an eventful year. Our Society has had its sadness but also some gladness. We have pointed with pride in letters past concerning many accomplishments and genuine progress. One recent event on the Washington scene gives me great satisfaction. Secretary Folsom of the Department of Health, Education, and Welfare has expressed the opposition of the Eisenhower administration to HR. 7225. This act of great wisdom, courage, and statesmanship deserves an expression of appreciation from all of us doctors. Please write Secretary of Health M. B. Folsom and express your thankfulness and strong support of the courageous position taken by the administration.

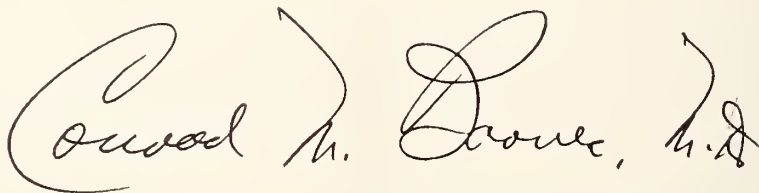
In Portland, Oregon, while representing you at the 11th National Rural Health Conference, I reported on the recent progress of our Society, particularly in the field of office assistants' education and medical school growth. I made a verbal request and invitation for the 1959 Rural Health Conference to be held in Kansas.

I am deeply appreciative of the help and cooperation all of you have given me during the past few months. I have found everyone to be very patient and reasonable. I shall never forget my experiences as your president. I feel inadequate and humble when I realize what a fine group of men have entrusted the safekeeping of their precious "Art and Science" to my care.

As we look forward to the annual state meeting, may I urge you to attend at least one or two days. It will do you much good. The Program Committee has been laboring and planning all year to give you the "best meeting ever." I hope I shall see you in Topeka.

May we forever be mindful of the need for kindly, personal sympathy and understanding as we apply our science in the rendering of medical care.

Sincerely, in the Practice of the Art,

A handwritten signature in cursive script that reads "Conrad M. Barnes, M.D.". The signature is fluid and elegant, with the first name "Conrad" being the most prominent.

CONRAD M. BARNES, M.D., *President*

Councilor Reports

Activities in the Different Geographical Districts of the State

FIRST DISTRICT

This year the First District dinner meeting was held at the Cody Hotel in Leavenworth. It was the first time we had had the pleasure of welcoming the Leavenworth County Society into the First District.

Through the cooperation of Dr. Gordon Stanley Voorhees, who made all the arrangements, the meeting was a wonderful success. We had as guests Mrs. Barrett A. Nelson, president of the Auxiliary; Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine; Mr. Oliver E. Ebel, secretary of the Kansas Medical Society, and Mr. Rueben M. Dalbec, executive assistant. Following the dinner Mrs. Nelson addressed the members of the Auxiliary and Dr. Wescoe addressed the physicians. Dr. Wescoe gave an enlightening talk on the responsibility of members of the Kansas Medical Society to the A.M.E.F. and its advancement. I think for the first time all members present realized the obligation each individual has to support medical education.

F. E. Wrightman, M.D., *Councilor*

SECOND DISTRICT

The Second District has encountered no particular problems during the past year.

The Wyandotte County Medical Society has attempted to improve its relations with lay health organizations by a more active part in their work.

Another innovation this year was an orientation program attempting to give new members of our society a background of the function of the county, state, and national medical organizations.

Wyandotte County Medical Society is looking forward to entertaining the state society in 1958. A new armory has been constructed in Kansas City, and we feel it is an ideal place in which to hold a state meeting.

Glenn R. Peters, M.D., *Councilor*

THIRD DISTRICT

We have had a successful year in the Third District since our split off into a new councilor district as authorized by the last Kansas Medical Society meeting. Everything has been smooth, and no troubles have been brought up.

Lynn County is still without a medical society and also without a young doctor to take the places of the

older doctors there. This will become a critical area because of the age of the physicians there now. However, we have not been able to get cooperation in establishing a society or bringing in any new young doctors. We hope this situation can be resolved soon, and we will continue to work on it.

H. Penfield Jones, M.D., *Councilor*

FOURTH DISTRICT

During the past year two new hospitals have been erected in this district. Additions have been made on a few others.

The new State Tuberculosis Sanatorium at Chanute will be opened July 1, 1956. This service to our area will be most welcome.

There has been widespread dissatisfaction with the polio immunization program throughout the district.

One county society is not satisfied with the manner in which the Medical Practice Act is being enforced.

There is widespread dissatisfaction with the administration of the welfare program in regard to providing medical care for the indigent.

The Southeast Kansas Medical Society has been active during the past year.

Charles E. Vestle, M.D., *Councilor*

FIFTH DISTRICT

The Fifth District has had no unusual activity in the past year.

Councilor district reorganization has produced no problems except for the difficulty in contacting Pottawatomie County membership.

I am happy to report almost 100 per cent cooperation in response to the appeal for education foundation donations in all counties except Pottawatomie.

S. A. Anderson, M.D., *Councilor*

SIXTH DISTRICT

Medical activities in the Sixth District have progressed smoothly during the past year.

Our physicians, in cooperation with the public health department, gave 14,191 polio shots to school children. These were administered to 8,500 children, 6,919 of whom received both shots.

We suffered a loss of six members during the year. Present membership stands at 179.

Federal hospital facilities in this area are rapidly being expanded. Work has started on the construction of a new Veterans Administration hospital which will cost \$20 million, and a new hospital at Forbes Air Force Base, costing \$3 million, will soon be completed.

St. Francis Hospital, Topeka, is currently conducting a campaign to raise \$500,000 for additional beds.

Meetings of the Shawnee County Society have been well attended, and stress has been placed on the economic aspects of the practice of medicine.

Floyd C. Taggart, M.D., *Councilor*

SEVENTH DISTRICT

No major problems have arisen in the Seventh District during the past year. Professional relationships within each county and among counties have been harmonious, and the public has received prompt and adequate medical care. No instance of any major criticism or dissatisfaction has come to my attention.

Attendance at the circuit course in Emporia has been fairly good. Other postgraduate courses have been well attended, and the caliber of local meetings has been uniformly high.

Management of the polio immunization program, in cooperation with the local public health physician, has been satisfactory up to this time and has represented a real public health effort and community service on the part of local physicians.

Edward J. Ryan, M.D., *Councilor*

EIGHTH DISTRICT

There have been no insurmountable problems in the Eighth District this year. The response to the A.M.E.F. and to the Porter Memorial Foundation funds has been good. I wish to express my thanks to the members of this district who gave of their time, money, and energy in making this good record possible.

The polio immunization programs have been carried out, or are in the process of being carried out. Here again, the cooperation of individual members of the medical society and of the societies themselves has been excellent. It is my opinion that members of the society would prefer that the remainder of this immunization program and future immunization programs be carried out through regular channels, as other immunization programs have been carried out skillfully and for the benefit of the public health and welfare by physicians in the past.

I have attended all of the Council meetings that have been called and have served on various special committees as requested. These meetings have been

enjoyable and instructive, although somewhat time-consuming.

Again I wish to say thank you to those members of our district who were asked to do extra work in making the various projects a success and who responded so enthusiastically. If any of our members have not contributed to the A.M.E.F. or to the Porter Memorial funds, it is not too late to do so.

James E. Hill, M.D., *Councilor*

NINTH DISTRICT

The Ninth District has had no major difficulties or problems during the past year. The councilor has attended each Council meeting and has attempted to represent the district as well as possible and to vote as the majority wished. It is extremely difficult to obtain an accurate vote from a district as large as this. As a result, the opinions of members in and around Saline County have been solicited.

For many years the northern portion of the area was so well represented by Dr. John M. Porter that visitations by the councilor were unnecessary. With Dr. Porter's untimely death, this situation has changed. If any societies in his area wish a report on any of the Council meetings, they may obtain information from the councilor. It is impossible adequately to replace Dr. Porter, but I will do my best.

At the coming House of Delegates meetings the question of transferring Ellsworth County from the Ninth District to the Thirteenth District will be introduced. At present Ellsworth County belongs to the Ninth District but has no membership in any of the local societies in the district. Members there feel they would have better representation in the House of Delegates and in the Council if their membership were transferred. Necessary agreement was obtained from the councilor of the Ninth District, and the proper letters were sent.

L. S. Nelson, Jr., M.D., *Councilor*

TENTH DISTRICT

Professional relations and activities in this district are satisfactory, and many interesting and worth while meetings of our county societies were held during the year. Three tri-county meetings were held, one each in Marion, McPherson, and Harvey counties, with excellent attendance at each.

This district is proud of the annual meeting of the Kansas Medical Society held in Hutchinson in 1955, and we feel that it was well demonstrated that accommodations are ample for such a meeting and that the Reno County Medical Society has what it takes.

H. M. Glover, M.D., *Councilor*

ELEVENTH DISTRICT

Medical activities in the Eleventh District have progressed satisfactorily during the past year. One of the most outstanding things for this period has been the excellent programs which have been presented at Sedgwick County Medical Society meetings.

We have had excellent response by the Sedgwick County Medical Auxiliary as far as public relations is concerned. They had a booth at the Home Show in Wichita, at which time they distributed many thousands of pamphlets and brochures relative to health affairs and conditions. The Auxiliary is also conducting a survey to determine the amount of time local physicians are giving to charity.

Dr. Clyde Miller, president-elect of the Kansas Medical Society, has appointed Dr. Homer Holt as general chairman and Dr. Ernest Crow as program chairman for the state meeting in 1957. These men have held some preliminary meetings with local representatives and representatives from over the state, and their particular committees are beginning to develop firm plans. If anyone has any ideas or suggestions to make as far as the general meeting is concerned, or about the program, I am sure either one of these men would be happy to hear from him.

A special meeting was held by the county society with representatives of Blue Shield. This was for the purpose of presenting the various plans proposed by Blue Shield for the information and education of the members.

The Eleventh District is looking forward to another successful year.

Norton L. Francis, M.D., *Councilor*

TWELFTH DISTRICT

Most of the societies of the Twelfth District have been active, medically and civically. They have held regular monthly meetings with good programs. The South-Central Tri-County Society held a meeting with their wives in February, and as a result of this meeting an Auxiliary was organized. I am sure they will become quite active.

Sumner County has organized a Safety Council. This is to teach first aid and first aid instructors, investigate accidents, and cooperate with the Sumner County Civil Defense organization.

Sumner, Barber, Harper, and Pratt counties were 100 per cent counties on A.M.E.F. contributions.

Cyril V. Black, M.D., *Councilor*

THIRTEENTH DISTRICT

There have been no pressing medical problems

affecting the practice of medicine in the Thirteenth District. The supply of physicians in each county is near adequate for the first time in the past 15 years. Each county has an adequate hospital except Osborne, and this area is well served by adjacent county hospitals.

The councilor wishes to commend his district for the large percentage who responded to his personal solicitation for A.M.E.F. funds. We believe that personal solicitation must be used throughout the Kansas Medical Society if we are to meet our financial obligations to our medical schools and keep the schools out of federal control.

Your councilor also wishes to note the deaths of two veteran general practitioners of wide acquaintance among Kansas medical men, Dr. F. E. Richmond of Stockton and Dr. E. C. Petterson of Plainville.

Your councilor has attended all meetings of the Council and the House of Delegates and has been greatly appreciative of the honor in being elected to this position.

L. W. Reynolds, M.D., *Councilor*

FOURTEENTH DISTRICT

Your councilor for the Fourteenth District reports that he believes the practice of medicine within this district has, in general, been on a high plane. A minimum of problems has arisen, and these have been straightened out satisfactorily.

Response to the A.M.E.F. solicitation has been gratifying, and if the same percentage can contribute next year and increase their contributions in amount, then we will approach the goal we should attain.

We regret the untimely death of our late president as many of us had the greatest personal respect and affection for him.

I am sure the Society can depend on our support for any and all measures that will raise the standards of the practice of medicine in Kansas.

Justin A. Blount, M.D., *Councilor*

FIFTEENTH DISTRICT

The principal activity in this district during the past year was the organization of the Comanche-Kiowa-Clark (C-K-C) Medical Society. This society requested a charter from the Council, and it was granted. Therefore, there is now one more district society to replace three small societies.

It is felt that this will strengthen the Society in the area. By combining societies we have a group large enough for good scientific meetings, and we





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¹January, H. L. et al. Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.



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look forward to having a spirited, interested membership.

L. G. Glenn, M.D., *Councilor*

SIXTEENTH DISTRICT

Medical practice in the Sixteenth District has been about the same during the past year.

The district had a dinner meeting in November for new members and their wives, at which Dr. and Mrs. Conrad Barnes were present. Dr. and Mrs. Murray Eddy were also invited, but because of a previous engagement were unable to attend.

Contributions to the A.M.E.F. from this district were about 75 per cent.

Dr. Kenneth Knuth left his practice in Atwood to take a residency in radiology in Kansas City. Dr. William Tappen also left his practice in Atwood for a

residency in medicine in Bakersfield, California. In February Dr. Warren McDougal moved to Atwood where he is now in practice. Dr. A. R. Cuadrado recently moved to Sharon Springs.

Refresher courses in Colby have been well attended.

It has been a pleasure to act as councilor for the Sixteenth District.

James L. Jenson, M.D., *Councilor*

SEVENTEENTH DISTRICT

During the past year things have been quiet in this district. There seems to be an adequate number of physicians. Hospital facilities are available so no one need go far from home.

Response to the education fund solicitation was good.

H. Preston Palmer, M.D., *Councilor*

Committee Reports

Activities of the Different Special Groups of the State

ALLIED GROUPS

R. R. Snook, McLouth, Chairman; H. S. Albaugh, Olathe; K. F. Bascom, Manhattan; C. H. Benage, Pittsburg; J. A. Billingsley, Kansas City; H. O. Bullock, Independence; H. J. Davis, Topeka; R. D. Dickson, Topeka; B. P. Meeker, Wichita; C. V. Minnick, Junction City; R. R. Reed, Beloit; L. F. Schmaus, Iola.

Your Committee on Allied Groups did not hold a formal meeting. It was the opinion of several of the members that we should meet in the event some new problem presented itself. No problem needing action appeared, so no meeting was held.

R. R. Snook, M.D., *Chairman*

ANESTHESIOLOGY

R. S. McKee, Leavenworth, Chairman; J. E. Gootee, Topeka; P. H. Lorhan, Kansas City; C. D. McKeown, Wichita; R. T. Parmley, Wichita; L. J. Ruzicka, Concordia; H. F. Spencer, Emporia; E. M. Sutton, Salina.

AUXILIARY

R. E. Pfuetze, Topeka, Chairman; E. M. Harms, Wichita; J. L. Jenson, Colby; E. R. Millis, Kansas City; L. J. Schaefer, Salina; W. O. Wallace, Atchi-

son; I. J. Waxse, Oswego; C. O. West, Kansas City.

The committee on Auxiliary has seen no need for a formal meeting as yet this year but will meet April 30 with the officers of the Auxiliary and their national president, Mrs. Mason Lawson, for consideration of problems and for an exchange of ideas. Although this is at the end of the year, it should be mutually helpful in formulating policies for the coming year.

In many respects this has been a highly successful year for the Auxiliary. This success can be measured by reporting the unprecedented growth of the Auxiliary. Two new tri-county groups have been organized: Kiowa, Comanche, and Clark; and Sumner, Harper and Barber. Three more counties plan on organizing soon. Following the new national Auxiliary policy, and with the consent of this committee, the Auxiliary is enlarging the nurse recruitment program to include recruitment in all allied medical fields.

Mrs. Barrett Nelson, president of the Auxiliary, very early planned the year's work and has enthusiastically helped guide the activities of the component groups. The many committees have promoted and are promoting their special endeavors successfully and deserve much credit for the success of this remarkable organization. Individual members have also contributed active leadership in community health.

As a group and individually the Auxiliary has contributed much to the Kansas Medical Society. In the

fields of public relations, recruitment of nurses and allied medical personnel, A.M.E.F., and others they have aided in stimulating the interest of the medical society, and conversely the medical society as a group and individually should greatly increase their support of *their* Auxiliary.

Robert E. Pfuetze, M.D., *Chairman*

BLUE SHIELD FEE SCHEDULE

R. G. Klein, Dodge City, Chairman; W. L. Beller, Topeka; H. S. Blake, Topeka; P. M. Clark, Jr., Independence; H. M. Foster, Hays; N. L. Francis, Wichita; G. F. Gsell, Wichita; A. G. Isaac, Newton; J. G. Lee, Jr., Kansas City; Wm. Lentz, Seneca; W. O. Martin, Topeka; D. N. Medearis, Kansas City; W. J. Reals, Wichita; C. B. Trees, Topeka.

Your Committee on Blue Shield Fee Schedule has had three meetings during the past year. In addition, each member was assigned the task of submitting a fee schedule for proposed \$4,500 and \$6,000 service income plans, which necessitated many subcommittee meetings.

After considerable effort, a schedule which the committee believed to be average fees was submitted to the Council of the Kansas Medical Society with the following resolution:

WHEREAS, The Blue Shield Fee Schedule Committee has been requested by the Blue Shield Board to submit fee schedules for proposed \$4,500 and \$6,000 service income plans, and

WHEREAS, Your committee has spent considerable time in obtaining average fees for the various services, therefore

Be It Resolved, That in a matter of this importance to the doctors of Kansas the committee respectfully requests that the proposed plans be deliberated upon and finally decided by the appropriate body of the Kansas Medical Society, and

Be It Further Resolved, That the schedules approximate what the committee considers to be adequate fee schedules for such plans if the plans are deemed necessary and adopted by the appropriate body.

The chairman wishes to express his thanks to all who participated in the work of this committee during the past year.

Robert G. Klein, M.D., *Chairman*

BLUE SHIELD RELATIONS

This committee was recommended by Blue Shield and is selected to represent the 17 council districts.

H. M. Glover, Newton, Chairman; M. L. Belot, Jr., Lawrence; R. M. Carr, Junction City; A. M. Cherner, Hays; S. T. Coughlin, Larned; H. S. Dre-

her, Sr., Salina; J. B. Fisher, Wichita; G. R. Hastings, Garden City; P. E. Hiebert, Kansas City; P. M. Hulett, Anthony; F. X. Lenski, Jr., Iola; L. R. Pyle, Topeka; E. J. Ryan, Emporia; E. B. Scagnelli, Dodge City; F. L. Smith, Jr., Colby; M. W. Wells, Winfield; E. T. Wulff, Atchison.

As suggested at the beginning of the year, I have called no meeting of the full committee during the year. Most of our members have participated in Blue Shield district meetings, some in the annual Blue Shield board meeting, and others in Council meetings where Blue Shield affairs have come up for discussion, especially at the Salina meeting in December.

I think membership on this committee has served as an inducement to its members to attend Blue Shield meetings when possible and to enlarge their knowledge of Blue Shield's problems and efforts to serve the people of Kansas in its field.

H. M. Glover, M.D., *Chairman*

CHILD WELFARE

L. N. Speer, Chairman, Kansas City; W. H. Crouch, Topeka; L. E. Eckles, Topeka; W. P. Hibbett, McPherson; E. D. Hinshaw, Arkansas City; T. C. Hurst, Wichita; B. I. Krehbiel, Topeka; W. F. McGuire, Wichita; H. C. Miller, Kansas City; T. E. Young, Winfield.

The Committee on Child Welfare spent considerable time during the past year discussing and helping to implement the polio immunization program in Kansas.

At a meeting on August 28, 1955, the committee heard Dr. A. G. Englebach, regional medical consultant for the National Foundation for Infantile Paralysis, present a résumé of activities relevant to Salk vaccine. After considering several methods of distributing vaccine, the committee recommended the program now in effect.

A subcommittee on newborn standards spent considerable time writing a pamphlet which will be available to physicians in the near future.

The committee has taken an active interest in the program carried out by the Kansas Council for Children and Youth. Dr. H. C. Miller represents this committee on the council.

L. N. Speer, M.D., *Chairman*

CONSERVATION OF EYESIGHT

W. M. Scales, Hutchinson, Chairman; F. N. Bosilevac, Kansas City; L. L. Calkins, Kansas City; J. B. Dixon, Parsons; J. E. Hill, Arkansas City; D. O. Howard, Wichita; D. T. Loy, Great Bend;

H. E. Morgan, Newton; L. C. Owensby, Concordia; J. S. Reifsneider, Wichita; D. P. Trimble, Emporia; D. D. Vermillion, Goodland.

The Committee on Conservation of Eyesight had one meeting during the year and plans two more before the Kansas Medical Society meeting this spring. It has concerned itself mainly with two problems.

The first problem is a review of the program with the Division of Services for the Blind of the Kansas State Board of Social Welfare. Dr. Karl W. Stock, state supervising ophthalmologist, has requested that the committee review the program with the purpose of modernizing care of the blind.

An effort has been made to institute a glaucoma survey in the state, and arrangements have been made whereby such a survey will be conducted this spring in Wichita at one of the large industrial plants.

The committee has also gone on record by a unanimous decision of disapproving the practice of medicine and surgery by an optometrist in the office of a doctor of medicine, and the committee recommends that the Council of the Kansas Medical Society take appropriate action.

William M. Scales, M.D., *Chairman*

CONSERVATION OF HEARING AND SPEECH

W. D. Pitman, Pratt, Chairman; C. W. Armstrong, Salina; V. R. Moorman, Hutchinson; G. O. Proud, Kansas City; R. E. Riederer, Olathe; E. M. Seydell, Wichita.

This committee has had no formal meeting this year. The members were contacted and it was decided that since we had no matters of an urgent nature and our committee was so scattered over the state, we would wait until the state meeting to call the group together if necessary.

W. D. Pitman, M.D., *Chairman*

CONSTITUTION AND RULES

A. W. Fegtly, Wichita, Chairman; D. P. Trees, Wichita, Vice-chairman; W. M. Brewer, Hays; N. E. Melencamp, Dodge City; C. C. Nesselrode, Kansas City.

The president, Dr. John M. Porter, upon appointing this committee, made two specific recommendations: (1) that all county societies be solicited for proposed amendments to the by-laws, and (2) that an attempt be made to obtain information on when county medical societies were issued charters. Efforts in both these fields have been quite unsuccessful.

An anonymous letter recommended that if a component society failed to send delegates to two or

more consecutive state meetings, that society should be dropped from membership in the Kansas Medical Society. This committee believes this should not be considered, however desirable it would be to have all societies represented in the House of Delegates. It appears this will not be a wise solution, and therefore this proposed amendment is not recommended.

Ellsworth County requests to be transferred from Councilor District No. 9 to District No. 13. This committee feels that county societies should be in the districts of their preference wherever possible and that the decision should rest strictly with the wishes of all societies concerned. Therefore, if District No. 9 is willing to lose Ellsworth County and if District No. 13 will accept Ellsworth County, this committee under such circumstances would recommend the following amendment to the By-Laws, Chapter VIII, Section 13:

"Remove Ellsworth County from District No. 9 and insert Ellsworth County as a portion of District No. 13."

Nemaha County has suggested an amendment bringing the president-elect rather than the vice-president into the presidency in case of death or removal from office of the president. The committee believes this change would not represent an improvement in Society activities and therefore does not offer this amendment for consideration.

This committee wrote letters to each component medical society asking information concerning their charters. The response has been disappointing in that 51 societies have failed to answer and replies have been received from 17. Of these, only six can locate charters. Four state their records indicate that a charter had been issued, and the remaining seven have no record whatever. This committee therefore believes that this situation does not require an amendment to the by-laws and would recommend to the Council that new charters be issued to each component medical society with a notice that this replaces an original charter and that the executive office keep a record of all charters issued.

A. W. Fegtly, M.D., *Chairman*

CONTROL OF CANCER

L. E. Vin Zant, Wichita, Chairman; J. P. Berger, Wichita; C. G. Bly, Kansas City; T. P. Butcher, Emporia; A. M. Cherner, Hays; A. A. Fink, Topeka; W. A. Grosjean, Winfield; H. L. Hiebert, Topeka; W. J. Kiser, Wichita; J. A. McClure, Topeka; C. H. Miller, Parsons; O. F. Prochazka, Liberal; D. C. Reed, Wichita; R. H. Riedel, Topeka; P. H. Schraer, Concordia; R. E. Speirs, Dodge City; G. M. Tice, Kansas City; H. M. Wiley, Garden City.

This has been an energetic and active committee the past year. Several meetings were held, and all were well attended by the members.

Old projects have been reviewed, and the desirability of continuation was determined. Twenty-one diagnostic tumor clinics were approved. Television programs for lay and professional education, methods to aid cancer patients, and study of cancer problems in rural areas were new topics under consideration.

The Mid-West Cancer Conference was held in Wichita, March 22-23. Speakers for the eighth annual conference to be held in 1957 are being selected, and we again expect to have a program of the best quality.

The members of this committee are making an all-out effort to control cancer in the state of Kansas, and we need everyone's help in this endeavor.

Larry E. Vin Zant, M.D., *Chairman*

CONTROL OF TUBERCULOSIS

J. W. Spearing, Columbus, Chairman; A. L. Ashmore, Wichita; Andre Baude, Topeka; M. L. Belot, Jr., Lawrence; R. I. Canuteson, Lawrence; M. J. FitzPatrick, Kansas City; M. R. Fitzpatrick, Kansas City; Charles Pokorny, Halstead; W. G. Rinehart, Pittsburg; C. F. Taylor, Norton; F. A. Trump, Ottawa.

The first meeting of this committee was held August 7 in Cherokee County with a good attendance which included President John Porter and several interested physicians of this vicinity.

The work in the forenoon included a tour of the mining fields and a descent of over 300 feet into a lead and zinc mine. After a buffet lunch a spirited meeting was held, and it was decided enthusiastically to endorse and assist in the survey conducted by the Kansas Tuberculosis and Health Association under the direction of Dr. J. B. Stocklen. The soon-to-be opened State Tuberculosis Hospital at Chanute, in its many ramifications, was discussed.

The second meeting was held at the Town House in Kansas City, December 18. Dr. Stocklen attended and gave an interesting report of his survey, which has proved to be a timely one. Many relevant matters were discussed, including study of a suitable isolation law for the recalcitrant tuberculous individual. Such laws of other states are now being reviewed by our members. A third meeting, for January or February, was planned, and it was decided to invite Dr. George W. Jackson, Kansas director of institutions, and the members of the Advisory Commission to attend.

This third meeting was held February 26 at the Kansan Hotel, Topeka, with Dr. Jackson and the Advisory Commission present. The staffing and oper-

ation of the Southeast Kansas Tuberculosis Hospital at Chanute was discussed. The meeting was interesting and informative.

The writer wishes to express great esteem for each member of this committee as well as for each of our distinguished guests. The enthusiasm of each has been stimulating, and he is convinced our Society and our state have derived some benefit.

Joseph W. Spearing, M.D., *Chairman*

EMERGENCY MEDICAL CARE

G. R. Peters, Kansas City, Chairman; Glen Ashley, Chanute; W. C. Bartlett, Wichita; F. C. Beelman, Topeka; S. R. Friesen, Kansas City; L. F. Glaser, Hutchinson; J. A. Howell, Wellington; J. G. Hughbanks, Independence; H. H. Hyndman, Wichita; J. M. Mott, Topeka; L. L. Saylor, Topeka; W. A. Smiley, Jr., Junction City; C. D. Voorhees, Leavenworth.

The Committee on Emergency Medical Care has been inactive this year.

The chairman consulted previous chairmen of the state committee, the president, and other officials of the state society. It was felt the time was not propitious to make any attempt at organizing the committee on a state-wide basis.

Under Civil Defense rules, health and emergency care is the responsibility of the State Board of Health. The Committee on Emergency Medical Care, of course, has been ready to cooperate with the Kansas State Board of Health if, and when, called upon to inaugurate a program. This call has not come.

Although there has been no attempt to organize disaster teams on a state basis, local units should be set up. Undoubtedly such units have been set up by most local Civil Defense organizations. In the Udall tornado disaster, the prompt action of the doctors of Sedgwick and surrounding counties undoubtedly saved many lives.

The Committee on Emergency Medical Care is an important committee and should be active.

Glenn R. Peters, M.D., *Chairman*

ENDOWMENT

C. V. Black, Pratt, Chairman; V. E. Chesky, Halstead; J. W. Randell, Marysville.

There were 395 Kansas contributors to A.M.E.F. in 1955, giving a total of \$10,425.73, an average of about \$25 per contributor. This was a 12 per cent participation by the doctors in the state. Several of the gifts were from firms, and others were on behalf of the Dr. Porter Memorial Fund. Several were from Woman's Auxiliaries. The Woman's Auxiliary to the

Kansas Medical Society contributed \$751. One doctor gave \$750, two gave \$250, and 21 gave \$100 or more. There were several 100 per cent counties, and five councilor districts were almost 100 per cent. There was about \$4,300 in the Porter Memorial Fund.

The A.M.E.F. program has been in existence five years, and to date it has not been successful. There is much talk of raising A.M.A. dues to secure the two million dollars needed. One large corporation which had been giving \$50,000 annually refused to give this year because the medical profession had not lived up to its end of the bargain. Senate Bill 1323 for federal aid in one-time grants to medical schools had the approval of the A.M.A. The Ford and Commonwealth funds will probably go to 10 non-tax institutions, and the funds so derived will be limited as to their use.

The most common objection of physicians to giving to A.M.E.F. is as follows: "Of course our tuition did not pay for our education, but most other professions are educated at the expense of the taxpayer too. Why should we be singled out to make up for this by contributions later on?" This is a mistaken idea. One large state school here in the southwest with an alumni group of 27,000 had almost 9,000 contributors, or 32 per cent, over a period of years. Their contributions average about \$10. The A.M.A. requested that the endowment committees of each state meet with officials of medical schools in their states. This has been complied with.

Cyril V. Black, M.D., *Chairman*

GENERAL PRACTICE AWARD

L. E. Leigh, Overland Park, Chairman; C. W. Bowen, Topeka; F. E. Dillenbeck, El Dorado; H. M. Glover, Newton; A. C. Harms, Jr., Kansas City; H. L. Low, Wichita; L. E. Rook, Kansas City; G. L. Thorpe, Wichita.

The information necessary for consideration of a general practice award for the year was not submitted by the constituent societies. Consequently, on the advice of the executive secretary of the Kansas Medical Society, no meeting of the committee was called.

L. E. Leigh, M.D., *Chairman*

HISTORY

W. M. Mills, Topeka, Chairman; R. R. Melton, Marion, Vice-chairman; H. C. Clark, Wichita; F. L. Loveland, Topeka; R. H. Major, Kansas City; R. T. Nichols, Hiawatha; R. A. Schwegler, Jr., Lawrence; M. O. Steffen, Great Bend.

Your committee has implemented the program au-

thorized by the House of Delegates last year. The University of Kansas has begun research on *A Century of Medicine in Kansas* under the direction of Dr. George L. Anderson, head of the Department of History.

At a meeting in Lawrence which was attended by Chancellor Murphy, Dr. John Nelson, dean of the graduate school, several department heads, and faculty members, your committee was advised that a completely satisfactory graduate student had not been found to write this history but that a substitute arrangement had been adopted.

Prof. Tom Bonner of the University of Omaha was introduced as the person selected to write the book. The Department of History at the University of Kansas would do the research. Prof. Bonner has had experience in this work, having recently written a history of the Chicago Medical Society under a scholarship at Northwestern. The University of Omaha will give him leaves of absence during each of the next three summers, which Dr. Bonner believes will be adequate to enable him to complete his work.

At the University of Kansas, graduate and undergraduate students are now engaged in assembling material on this subject. The assistance of the physicians of Kansas is most necessary for its successful outcome. Your committee therefore requests that each county society and every physician offer to make available to the Department of History at the University of Kansas any material that might be of interest. This includes such things as old minutes and records of any kind which show how medicine was practiced in the past and how organized medicine operated, when societies were formed, how, etc.

A second area of interest to this committee is the collection of material suitable for use in a permanent medical display at the Kansas State Historical Society. Your committee has negotiated with Mr. Miller, director of the museum, who is presently engaged in constructing a pioneer doctor's office. He now hopes the profession will fill this exhibit with material pertinent to the practice of medicine of pioneer times. This committee is again soliciting the cooperation of all members who have such materials available. Already received or promised are an examining table built 90 years ago, a pair of saddlebags, and three old surgical instruments. It is expected that this permanent museum exhibit will stimulate interest in preserving material of this type and that a great many additional pieces will be contributed. Before sending anything, members are asked to write the committee at 315 West Fourth Street, Topeka, concerning what is available.

W. M. Mills, M.D., *Chairman*

HOSPITAL SURVEY

A. E. Rueb, Salina, Chairman; S. A. Anderson, Clay Center; P. S. Combs, Leavenworth; A. D. Danielson, Herington; E. R. Gelvin, Concordia; G. D. Marshall, Colby; R. H. Moser, Holton; H. E. O'Donnell, Junction City; P. A. Petitt, Paola; W. W. Pierson, McPherson; L. P. Randles, Fort Scott; A. J. Rettenmaier, Kansas City.

This committee did not meet during the year and has no report.

Andrew E. Rueb, M.D., *Chairman*

INDUSTRIAL MEDICINE

W. L. Anderson, Atchison, Chairman; J. A. Grove, Newton; H. R. Hodson, Wichita; W. H. McKean, Kansas City; J. H. A. Peck, Sr., St. Francis; H. L. Regier, Kansas City; R. W. Urie, Parsons; M. A. Walker, Kansas City.

The Committee on Industrial Medicine had one meeting during the past year, and it was well attended. There was a discussion of the problems of Workmen's Compensation with the state compensation commissioner. An agreement of practices and procedure on reporting compensation cases was worked out to the satisfaction and understanding of all concerned.

It was decided to publicize the changes in the compensation laws and interpretation of the same. A discussion was held on the possibility of including a speaker on industrial medicine in the circuit course of the medical school. A report was compiled and sent to the American Medical Association Committee on Industrial Health.

W. L. Anderson, M.D., *Chairman*

MATERNAL WELFARE

Robert Sohlberg, Jr., McPherson, Chairman; R. M. Carr, Junction City; L. E. Filkin, Concordia; H. M. Floersch, Kansas City; D. E. Gray, Topeka; R. G. Heasty, Manhattan; D. S. Klassen, Newton; G. M. Martin, Topeka; R. A. West, Wichita.

The committee has concerned itself mainly with putting into operation a practical, complete, and acceptable method of studying maternal deaths. At present the mechanics have been worked out, and the plan is ready for operation.

The state has been divided into districts, and the president of the Kansas Obstetrical Society has secured the consent of one member in each district to serve in the capacity of collector of information.

When a certificate indicating maternal death is received in Topeka, the Director of Maternal and Child Health will notify the chairman of this committee who, in turn, will write to the doctor in attendance at the death and the society representative in the district, requesting them to meet and complete the questionnaire which is then returned to the committee chairman.

The Division of Maternal and Child Health will prepare an abstract of each case, which will serve as a basis for discussion at the next committee meeting. Since information has been available for only a few of the maternal deaths in the past few months, few have been discussed by the committee.

In cases of maternal deaths resulting from abortion or in patients cared for by cultists, investigations will be conducted by the Kansas State Board of Health directly.

At the request of the adoption agencies in Kansas, the committee is preparing a set of minimum standards for infertility study.

Robert Sohlberg, Jr., M.D., *Chairman*

MEDICAL ASSISTANTS

M. C. Eddy, Hays, Chairman; L. G. Allen, Kansas City; W. P. Callahan, Sr., Wichita; G. A. Chickering, Hutchinson; A. E. Hiebert, Wichita; H. U. Kennedy, Topeka; Walter Stephenson, Norton.

Your Committee on Medical Assistants has witnessed a recent and rather remarkable achievement of the Kansas Medical Assistants' Society, which though under casual preparation for several years, became accelerated during the latter portion of 1955 and was placed in effect in March of 1956.

For 21 consecutive days, March 11 to 31 inclusive, nightly meetings were held at seven separate centers throughout your state, Parsons, Wichita, Dodge City, Colby, Hays, Salina, and Lawrence. A total of 63 lectures were given, nine at each center. Approximately 400 medical assistants attended all the meetings.

Seven attorneys from the Medical-Legal Committee of the Kansas Bar Association participated in a lecture on privileged communications. Professors of economics from Kansas colleges, several members of the Kansas Medical Assistants' Society, members of the Committee on Medical Assistants, and related members at large throughout the state cooperated by giving talks and participating in round table discussions at the various centers where the meetings were held.

Your chairman, who attended the first full week of these meetings, was impressed by the fine caliber

of medical assistants who attended the meetings, he was gratified by their interest and ability to analyze the problem of proper handling of patients and office techniques, and he was astounded at the revelations of insight which were brought out during the round table discussions.

Primarily, of course, your Council approved this series of seminars as a means of further educating your own assistant by lectures concerning everything from proper telephone techniques to billing, economics, personal charm and courtesy, to privileged communications. What we did not expect to gain was an over all critical evaluation of the physician, regarding particularly his inadequacies as a business man, his disregard of some elementary principles of office management, and at times, an almost unbelievable obstinacy in accepting assistance which his own office personnel is qualified, willing, and anxious to give.

We have received a picture of diffuse concepts and misconcepts of what constitutes a well run office or practice. We have urged the girls to speak frankly, to bring them out, so that various ways of settling these could be discussed by the group. The cooperation and frankness of the assistants in bringing out problems and the frequency with which the same questions came up gave me a most excellent opportunity of observing, from an entirely different viewpoint than my own, the reasons why people are unhappy with medicine.

In a way these are reassuring. You may find them amusing if you wish to dismiss the trivia which are at the bottom of very real problems. It is by scrutinizing these as carefully as possible that I feel qualified and justified in making certain suggestions to you.

You may not know it, but your medical assistant would like to make the Kansas patient the best handled and happiest patient in the world. That is what they say. By starting this study of their own job, for their own betterment and your benefit, they have proved their interest and sincerity in doing just this.

What I have to say to you, therefore, if you wish to avail for yourself the aid and cooperation which is ready for you, can be summed up in a few words.

1. Delegate more authority, but be ready to make decisions when she asks. Accept her advice occasionally.

2. Divorce yourself from accounts, except to advise her who to really go after. Never tell a patient to pay whenever it is convenient; tell him to make definite arrangements to pay her. Be sure she is bonded and that your books are kept in such a manner that an accurate check may be made. You owe her this protection; it puts you on a business basis.

3. Keep your assistant informed as to your whereabouts. This is one of her chief concerns. She has

been told that she is responsible for getting the patient and you together quickly and efficiently. She has also been told that you must decide whether or not you wish to be available or not available. This decision is yours. She can't make you inform her as to your whereabouts. You may be interested to know that the business of not being available is the number two complaint of your patients. Stop making appointments on your own—unless you write them in the book. Don't fuss at her if you do.

4. Set up some program—the best you can—to facilitate seeing patients without the long frustrating wait. It may take a long time to make this perfect. It may never be perfect, but it can certainly beat what is going on in many offices now. This may be the first problem in public relations you have to face. It is obvious that in many instances you have been guilty of unjustified waste of the patient's time, in an effort, perhaps, to see too many people. She will help you do this. Most of these complaints arise in offices where an appointment is not available, such as (a) sign in systems, (b) grab a number system, (c) come in and hope to God you see him system. Often the economics involve greater loss from loss of income than your fees.

You can increase your income by consulting daily with your assistant concerning the work done outside office hours and what you wish to charge for it, no forgotten charges, quicker posting of accounts, greater accuracy. Hold still long enough for her to get this information—she has been told to get it. You have to cooperate if she does.

On the good side of the ledger, and so that you can feel better:

1. Patients generally appreciate you, think you are kind and considerate, that medical fees are fair.

2. Think you are overworked, are inclined to be generous with you. Some think this overworked business is a pose, and that your planning is lousy—that your time allocation is poorly worked out. My opinion is that each group is about half right.

Conclusions: You would do better to:

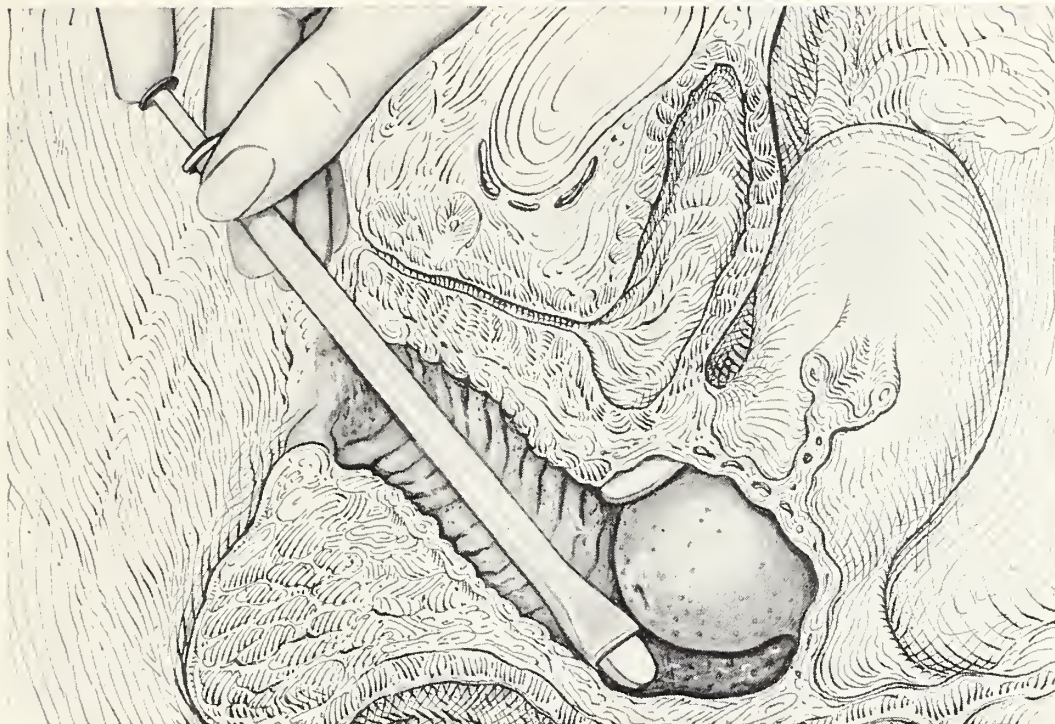
1. Plan your office routines better with her.

2. Keep hands off collections. Don't have her billing patients while you tell them to take their time.

3. Let her make the appointments—patients will learn this quickly.

4. Let your assistant know where you are. This is easy and you owe her this courtesy.

5. Don't talk "down" to your office assistant. Do not criticize her before patients. Treat her as courteously as you do your patients. Take the time to confer with her as to proper changes in procedure, etc.

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6. Don't let her go to your head. You will never be as important, as kind, or as wise as she thinks you are.
Murray C. Eddy, M.D., *Chairman*

MEDICAL ECONOMICS

G. E. Kassebaum, El Dorado, Chairman; W. F. Bernstorff, Winfield; J. N. Blank, Hutchinson; R. R. Cave, Manhattan; W. J. Feehan, Kansas City; J. H. Lathrop, Concordia; R. McCoy, Coldwater; M. B. Miller, Topeka; J. C. Mitchell, Salina; B. A. Nelson, Manhattan; L. S. Nelson, Jr., Salina; L. W. Reynolds, Hays; L. W. Shepard, Larned; H. L. Songer, Lincoln; J. K. Wisdom, Wichita.

Two meetings of the Committee on Medical Economics have been held and a third is projected. Interest and attendance have been good.

A group life insurance program with the American United Life Insurance Company has been approved and is in the process of being presented to members of the Society.

Present health and accident plans were reviewed, and some changes were suggested. These should be available soon.

The Jenkins-Keogh bill in Congress was discussed at length and approved in principle, but it was suggested that the amount of savings be placed higher than the proposed 10 per cent.

There was some discussion of the dispensing doctor and the code of the American Medical Association as adopted at the last A.M.A. session. While there is considerable dissatisfaction by pharmacists, the committee felt the present stand is as good as can be worked out at present.

There is a great deal of dissatisfaction by the profession over the state with the welfare program for Kansas. There is no uniformity in the way it is being carried on, and a great deal of unfairness results. Since our state and federal government agencies have ruled there is no legal family responsibility, a great many retired people fall into the indigent class. The committee feels that a new definition is needed for the word indigent so that many now so-called indigent with well-to-do children would not be relegated to this pauper classification. If these people really are to be accepted as indigent on such a flimsy basis, it is time that the profession insist upon the welfare department being more realistic in caring for them and stand the true cost of same. Further investigation and planning is being done along these lines.

The committee has been very faithful and I have enjoyed working with them.

G. E. Kassebaum, M.D., *Chairman*

MEDICAL PRACTICE ACT

L. R. Pyle, Topeka, Chairman; N. L. Francis, Wichita; J. A. McClure, Topeka; C. W. Miller, Wichita; L. S. Nelson, Sr., Salina.

By action of the House of Delegates in 1955, this special committee was organized to work with a committee from the Kansas State Board of Medical Registration and Examination and the attorneys for the medical society and the medical board toward preparing revisions of the Kansas Medical Practice Act which would modernize it and make it adaptable to present needs.

The committee begs leave to present a supplementary oral report to the House of Delegates on this subject.

L. R. Pyle, M.D., *Chairman*

MEDICAL SCHOOLS

R. W. Fernie, Hutchinson, Chairman; R. G. Ball, Manhattan; C. M. Barnes, Seneca; J. A. Blount, Larned; J. B. Fisher, Wichita; A. C. Hatcher, Wellington; N. M. Jenkins, Salina; D. A. Kendall, Great Bend; R. B. McVay, Clay Center; R. E. White, Garnett; G. G. Whitley, Douglass.

This committee held two meetings during the year, the first independently and the second with the Committee on Rural Health at the office of the dean of the medical school.

The committee has attempted to study every complaint concerning the medical center and received none during the year except two critical letters in protest of what actually was a committee activity.

For years one of the principal problems relative to cooperation between the practicing physician and the school of medicine has resulted from lack of information concerning referrals. The committee requested a statement from the dean as to the proper referral procedure and published this, together with the names of the full-time faculty members, in the JOURNAL. As a result of this, two critical letters were received, both of which were reviewed during the second committee meeting, after which the committee resolved to accept full responsibility for the printing of the article. The committee reiterated the integrity of its purpose and again declared that the action was brought about by demands made upon the committee from many physicians. The committee sincerely regrets that the JOURNAL article had a different effect upon the two physicians than was intended.

The committee studied a number of projects of the school such as the Dean's Hour, the preceptor program, etc., and after careful review and numerous

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(1) Payne, R. W.; Shetlar, M. R.; Farr, C. H.; Hellbaum, A. A., and Ishmael, W. K.: J. Lab. & Clin. Med. 45:331, 1955. (2) Bunim, J. J.; Williams, R. R., and Black, R. L.: J. Chron. Dis. 1:168, 1955. (3) Holbrook, W. P.: M. Clin. North America 39:405, 1955.

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suggestions the committee believes that these programs should continue as presently operated. This statement is made after the committee deliberated for hours on such things as expanding the preceptor program to include urban communities. Each suggestion was carefully considered and rejected only after the preponderance of evidence indicated that the suggestion would actually prove detrimental to the program.

The above also includes such things as student selection, the curriculum, etc. In every instance, when the subject was explored, the committee voted to withdraw the suggestion in favor of continuing each program on its present basis.

Among the principal activities of this committee during the past year was promotion of National Medical Education Week, April 22-April 28. This committee sent letters to each county medical society requesting every society to participate in some public program during that week. It was suggested that public forums with panel discussions might be employed, that radio or television programs be prepared, or that the medical profession sponsor assemblies in high schools or colleges.

The committee listed some suggested topics as possible ideas for programs. These included a comparison of medical education of 50 years ago with today, longevity and morbidity records as tribute to present day medical education, a description of educational facilities in the United States and Kansas, present needs of medical schools, etc.

This committee also issued a formal request to the governor of the state of Kansas that he proclaim the week of April 22-April 28 as Medical Education Week.

In connection with the above program, Dean Wescoe informed the committee that it costs the state approximately \$10,000 in addition to student fees to educate a physician. If this is amortized into the 40 years the average physician practices, the state has an interest of \$250 a year in the doctor. It costs the state approximately \$1,600 in addition to student fees to educate a teacher. The average teacher remains in her profession under four years, which means the state of Kansas spends \$400 each year for the services of a teacher in contrast to \$250 for the doctor.

The committee takes pride in announcing to the profession that the graduate program at the University of Kansas School of Medicine is the best attended of any medical school in the United States. The committee is proud of its school and wishes to commend the dean and the faculty for the operation of a school in which the vast majority of Kansas doctors take pride.

R. W. Fernie, M.D., *Chairman*

MENTAL HEALTH

W. F. Roth, Jr., Kansas City, Chairman; A. J. Adams, Wichita; H. V. Bair, Parsons; A. P. Bay, Topeka; O. R. Cram, Jr., Larned; J. A. Dunagin, Topeka; D. B. Foster, Topeka; T. L. Foster, Halstead; Mary Glassen, Phillipsburg; E. D. Greenwood, Topeka; L. W. Hatton, Salina; T. R. Hood, Topeka; G. W. Jackson, Topeka; P. C. Laybourne, Jr., Kansas City; R. A. Moon, Prairie Village; R. F. Schneider, Kansas City; D. R. Wall, Wichita; M. E. Wright, Lawrence.

During the past year the Committee on Mental Health has continued to work along lines established by the committee in previous years. The aim of the committee has been to represent the Kansas Medical Society in taking a stand for better treatment of the mentally ill in Kansas and in promoting participation of the medical profession in educational activities conducive to better mental health in the population.

There have been three general meetings of the committee, all held in Topeka. Various situations where committee action might be appropriate have been studied and policies of procedure outlined. The most important topics have been (1) modernization of Kansas laws concerning care of the mentally ill; (2) improvement of provisions under the Blue Cross plan for treatment, in the community, of the mentally ill, and (3) advancement of mental health education through provision of a panel of speakers available to discuss mental health topics.

The Sub-committee on Legislation (Dr. J. A. Dunagin, chairman) is currently making plans to meet with Dr. Guild of the Legislative Council Research Department and with the Committee on Public Health and Welfare of the Legislative Council for the purpose of consulting with and advising the council as it studies proposed changes in laws pertaining to the care of the mentally ill. Our committee takes the stand that the care of the mentally ill is primarily a medical matter, although it has certain legal aspects, and that it is in the public interest for legislation concerning the treatment of psychiatric patients to be guided by physicians experienced and skilled in the specialty of psychiatry.

The Sub-committee on Blue Cross (Dr. T. L. Foster, chairman) has had the assignment of conveying to the leaders of the Kansas Blue Cross-Blue Shield organization the consensus of the committee on the matter of insurance coverage of psychiatric illness. The committee strongly urges that Kansas Blue Cross-Blue Shield make a thorough study of the facts brought out by actuarial research in other parts of the country, that it take steps to eliminate discrimination

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against the medically or psychiatrically ill patient, better to adapt Blue Cross-Blue Shield provisions to the needs of the people.

The Sub-committee on Mental Health Education (Dr. Mary Glassen, chairman) is continuing the work it started last year, providing a list of subjects for mental health talks or programs which may be selected by medical societies or other organizations throughout the state. This year an attempt is being made to enlarge the panel of speakers available for such programs and, through the cooperative effort of sub-committee members in several parts of the state, to expedite the supplying of speakers when requests for them are submitted.

William F. Roth, Jr., M.D., *Chairman*

NECROLOGY

C. W. Miller, Wichita, Chairman; J. F. Gsell, Wichita; J. D. Hilliard, Medicine Lodge.

The Committee on Necrology submits the following list of members of the Kansas Medical Society whose deaths have been reported since the last meeting of the House of Delegates:

<i>Name and Address</i>	<i>Age</i>	<i>Date</i> <i>1955</i>
Dr. Charles Walter Lyon, Ellinwood	79	Mar. 3
Dr. E. Russell Jacka, Wichita	48	Mar. 28
Dr. Pinkney Shannon Townsend, Coffeyville	69	Apr. 6
Dr. Lawrence Wallace Cazier, Wamego	64	Apr. 10
Dr. Frank L. DePew, Howard	77	Apr. 24
Dr. Julius Anthony Burger, Kansas City	64	May 3
Dr. Harold Houston Jones, Sr., Winfield	63	May 30
Dr. John Donovan Clark, Wichita	80	June 6
Dr. Robert Y. Jones, Hutchinson	73	July 3
Dr. Wendell Maurice Tate, Peabody	49	July 12
Dr. Agnes Louise Robbins, Kansas City	46	July 15
Dr. Seth A. Hammel, Topeka	76	July 28
Dr. Charles Willard Longenecker, Kingman	83	Aug. 6
Dr. James Harlan Adams, Wichita	80	Aug. 17
Dr. James Arthur McLaughlin, Wichita	85	Aug. 19
Dr. James Dennison Colt, Sr., Manhattan	88	Aug. 31
Dr. Frederic E. Nipple, M.D., Mulberry	80	Sept. 1
Dr. Delos Meeker Stevens, Oskaloosa	65	Sept. 2
Dr. John McGill Porter, Concordia	56	Sept. 5
Dr. Frederick Donald Smith, Wichita	57	Sept. 13
Dr. William Osee Poston, Quenemo	70	Sept. 15

Dr. Chase B. Johnson, Lawrence	64	Oct. 7
Dr. James Willboarn S. Cross, Osborne	88	Oct. 16
Dr. Charles Melbourne Miller, Oakley	77	Oct. 16
Dr. Victor G. Haurly, Sr., Wellsville	50	Nov. 11
Dr. Thomas Grover Orr, Sr., Kansas City	71	Nov. 19
Dr. Raymond Joseph Leiker, Great Bend	52	Nov. 22
Dr. Bert Elba Miller, Council Grove	75	Nov. 26
Dr. Ralph R. Clutz, Bendena	78	Nov. 30
Dr. Charles Henry Lerrigo, Topeka	83	Dec. 4
Dr. Louis Boucher Gloyne, Kansas City	62	Dec. 8
Dr. John T. Kennedy, Blue Mound	77	Dec. 16
1956		
Dr. Edwin McCormick Ireland, Pratt	74	Jan. 10
Dr. Edward Chester Petterson, Plainville	61	Jan. 14
Dr. William Lewis Borst, Topeka	83	Jan. 21
Dr. Robert Campbell McIlhenny, Conway Springs	61	Feb. 9
Dr. Marlin Samuel McCreight, Oskaloosa	85	Feb. 10
Dr. Robert Louis Von Trebra, Chetopa	84	Mar. 11
Dr. John Arthur Hibbler, Jr., Kansas City	44	Mar. 12
Clyde W. Miller, M.D., <i>Chairman</i>		

NOMINATIONS

H. N. Tihen, Wichita, Chairman; W. F. Bernstorff, Winfield; W. P. Callahan, Sr., Wichita; W. M. Mills, Topeka; J. H. A. Peck, Sr., St. Francis.

A meeting of the Nominating Committee of the Kansas Medical Society was held in Salina in December, and the following names were proposed for the various offices to be filled by vote of the House of Delegates at the annual session in May:

FOR PRESIDENT-ELECT

Dr. Barrett A. Nelson, Manhattan

FOR FIRST VICE-PRESIDENT

Dr. Cyril V. Black, Pratt
Dr. Thomas P. Butcher, Emporia
Dr. Grant R. Hastings, Garden City
Dr. Dwight Lawson, Topeka
Dr. Glenn R. Peters, Kansas City
Dr. Robert Sohlberg, Jr., McPherson

FOR SECOND VICE-PRESIDENT

Dr. Cyril V. Black, Pratt
Dr. Thomas P. Butcher, Emporia

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Dr. Grant R. Hastings, Garden City
 Dr. Dwight Lawson, Topeka
 Dr. Glenn R. Peters, Kansas City
 Dr. Robert Sohlberg, Jr., McPherson

FOR CONSTITUTIONAL SECRETARY

Dr. George E. Burket, Jr., Kingman

FOR TREASURER

Dr. John L. Lattimore, Topeka

FOR A.M.A. DELEGATE, 1957-1958

Dr. Lucien R. Pyle, Topeka

FOR A.M.A. ALTERNATE, 1957-1958

Dr. Norton L. Francis, Wichita
 Dr. H. P. Jones, Lawrence
 Dr. Edward J. Ryan, Emporia

The list is presented now in accordance with provisions of the Constitution and By-Laws. Additional nominations, of course, may be made from the floor at the time of the election.

H. N. Tihen, M.D., *Chairman*

PATHOLOGY

T. R. Hamilton, Kansas City, Chairman; A. A. Fink, Topeka; C. A. Hellwig, Halstead; N. P. Sherwood, Lawrence; B. E. Stofer, Wichita.

The Committee on Pathology has considered several problems and from discussion has some recommendations to make for the Society. In certain areas additional study and consultation appears to be indicated before advice to the president and the Society would represent crystallized opinion in this field.

For the meeting of this committee on Sunday, March 4, in Kansas City, Doctors A. A. Fink, T. R. Hamilton, and C. A. Hellwig with Mr. Oliver E. Ebel were in attendance. The agenda centered upon (1) medical examinership, (2) status and outlook for *Treponema Pallidum* antigens in testing for syphilis, (3) self-examination of laboratories on a voluntary basis, and (4) use of isotopes in the laboratory.

Problems of post-mortem medical examinership in Kansas were discussed at length, and some time was spent in studying a possible standardized law on the subject of coroners with consideration of the Model Post-Mortem Examinations Act and House Bill No. 139. After due consideration the committee voted to make the following recommendations for approval of the House of Delegates:

1. That changes be made in the present Coroners Law and that the Kansas Medical Society cooperate

with other agencies and organizations in an effort to obtain a favorable opinion of the 1957 Kansas legislature.

2. That a State Coroners Commission be recommended and that it consist of the attorney general or his designated representative; the dean of the University of Kansas School of Medicine or his designated representative; and a practicing pathologist who is a member of the Kansas Society of Pathologists. On this question the committee was divided with some strong preference indicated for a commission of five, whereby there should be included, in addition to the above, a representative of the Kansas State Bar Association and a representative of the Kansas Medical Society. The committee, therefore, submits these two suggestions for Society consideration.

3. The powers and duties of the Coroners Commission shall be:

a. To make rules and regulations governing the exercise of its functions.

b. To make rules and regulations governing the procedure to be followed by county coroners in making inquests.

c. To require reports from county coroners on such matters and in such form as the board shall require.

d. To designate one or more persons in each county as qualified for the position of coroner of such county.

e. To remove, after hearing, any county coroner for misfeasance or malfeasance in office.

f. To promote methods for the training of county coroners in the science of medical-legal investigation.

g. To initiate and augment a program of forensic medicine at the University of Kansas School of Medicine.

4. That this committee, if and when the project is approved by the Kansas Medical Society, immediately meet with representatives of the Kansas State Bar Association; the Kansas Medical Society; Kansas Funeral Directors and Embalmers Association, Inc.; the Research Council of the legislature; the attorney general; the Kansas Official Council; the dean of the University of Kansas School of Medicine; the Kansas Society of Pathologists, and others, for the purpose of studying legislative procedure regarding this enactment.

5. That if persons must be duly qualified for such position as coroner, this committee has no interest in whether the office of coroner then remains an elective or becomes an appointive commission (position).

Pros and cons regarding use of terms, e.g. post-mortem and medical examiner, were discussed. There



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References: 1. Bunim, J. J., et al.: J.A.M.A. 157:311, 1955. 2. Forsham, P. H., et al.: Paper presented at First Internat. Conf. on Prednisone and Prednisolone, New York, May 31-June 1, 1955. 3. Perlman, P. L., and Tolksdorf, S.: Scientific Exhibit presented at A.M.A. Annual Meet., Atlantic City, June 6-11, 1955.

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appears to be some merit to the term "Board of Post-mortem Medical Examination" as one possibly most appropriate for State Coroners Board in House Bill 139.

The next item concerned laboratory tests for syphilis. There was considerable discussion, after which quotations from an article by Harold J. Magnuson, M.D., in the *American Journal of Public Health*, February, 1956, entitled, "The Treponema Pallidum Complement-Fixation Test" were considered an excellent expression of a possible new solution to an old problem. This summary is copied in its entirety as expressing the agreed opinion of this committee:

"The medical and lay readers have had ample opportunity in recent years to learn some of the inadequacies in serologic tests employing lipid antigens. The TPI (Treponema Pallidum Immobilization) test has proved an important tool in resolving many of the diagnostic dilemmas in which the clinician may find himself. Because technical limitations have precluded the widespread use of the TPI test, a number of laboratories have been seeking test procedures that would compare in specificity with the TPI test but could be more easily applied. Often it is not recognized that these newer test procedures, that is, immune-adherence, agglutination, and complement-fixation, clearly demonstrate that syphilis evokes a variety of antibodies. Equally important is

the fact that no single test technic, including the TPI, will measure all of these antibodies. It is more likely that one or more of the treponemal tests can be expected to reduce the margin of diagnostic error but never eliminate it. Thus, the fond dream of many clinicians that some one test represents the single definitive procedure seems doomed to failure.

"As antigen for TPCF (Treponema Pallidum Complement-Fixation) testing becomes more generally available, the evaluation of this test procedure will advance at a more rapid rate. It is to be hoped that during the next year or so a comprehensive evaluation of all treponemal test procedures will be made which will permit a carefully controlled analysis of the relative reliability and usefulness of these diagnostic procedures. In the meantime, two commercial manufacturers are beginning the production of TPCF antigen. If the present trends continue, such production will make it possible for the well run serologic laboratory to perform these tests. The results should be useful to state laboratories and clinicians in helping to resolve some of the perplexing diagnostic problems that arise in the serodiagnosis of syphilis. We know of no laboratory test that is infallible, but we believe that the TPCF test results will be as helpful as those offered by any other single test procedure."

The committee suggests the name of Dr. Harold J.

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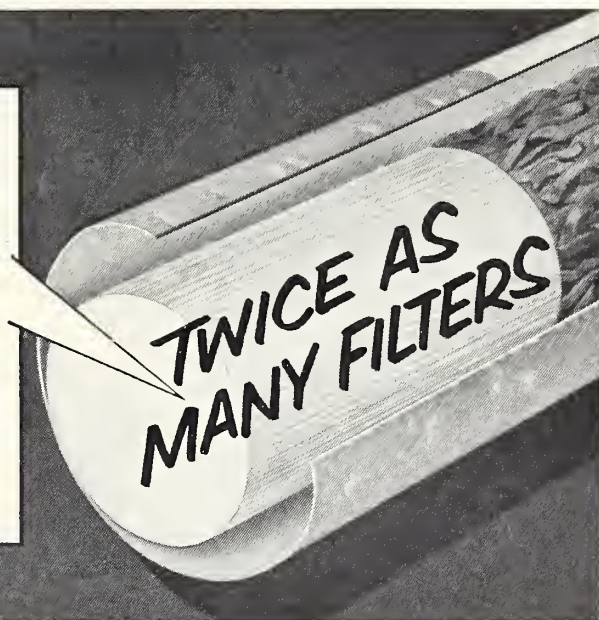
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Magnuson as a speaker for the 1957 meeting of the Kansas Medical Society at Wichita and requests the executive secretary to give this suggestion to the Program Committee.

The item concerning self-examination of laboratories on a voluntary basis was next under discussion. A program in which his laboratory cooperates along with others in performance of tests sent each month on some different chemical examinations was discussed by Dr. Fink. The results for these unknowns are sent back to the originator who then sends a monograph on the subject (each month); this has been a worth while procedure. This service has been limited to laboratories which are directed by pathologists.

Concerning the problem of who is responsible for laboratory procedures, it was decided that the director of a laboratory is responsible for all work performed therein. A consultant does not assume such responsibility.

The shortage of technologists was discussed. The statement that no laboratory is worth any more in any one day than the people who are working in it that day was expressed by the chairman.

The laboratory poses one of the greatest problems in medicine today. Inherent dangers from errors are great. Therefore, self-examination is important. Although services are available in the fields of chemis-

try and serology, there should be introspective examination throughout each laboratory or no controls will be of everyday value. This is a problem of education rather than of regimentation.

All effort should be made to encourage study and to promulgate teaching of technicians. Help in solving this problem (discussed in meeting of this committee a year ago) may be offered by instruction and demonstration in conjunction with circuit courses or by in-residence training in approved schools for medical technology or in appropriate departments at the University of Kansas Medical Center.

The next item was on the subject of isotopes in the laboratories. It is possible for laboratories to do some blood volumes and I-131 studies. However, this should be in conjunction with a radiologist and/or a physicist in a program certified by the Atomic Energy Commission; there are about six such programs currently operating in Kansas. The committee advises any laboratory contemplating work of this nature to proceed carefully and under the controls prescribed by AEC.

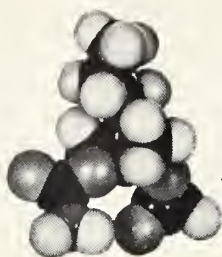
Other items not on the original agenda were considered. The next one concerned the Iowa lawsuit. This committee requests the House of Delegates to support the position that a pathologist is a physician and in the interest of preserving free enterprise in medicine, the Kansas Medical Society should be in-

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terested in the outcome of the Iowa case and should agree by resolution with the stand taken by the Iowa Medical Society.

The final subject for discussion during the day concerned Blue Shield and the fact that it is now making some limited payments for biopsies. Consistent with the above position, concerning a pathologist, the vote of the committee carried that services (such as his) should be allowable under Blue Shield and recommended that steps should be taken in this regard. It appears that details pertaining to this situation should be a subject of discussion by the Kansas Society of Pathologists. It was decided that the president of that organization, Dr. C. J. Weber of Salina, should be invited to attend meetings of this committee. This committee has been short one member since Dr. N. P. Sherwood has been a visiting professor in Indonesia.

T. R. Hamilton, M.D., *Chairman*

POLIO VACCINE

L. E. Leigh, Overland Park, Chairman; V. E. Brown, Sabetha; W. H. Crouch, Topeka; D. E. Gray, Topeka; C. C. Gunter, Quinter; J. E. Hill, Arkansas City; C. W. Miller, Wichita; D. J. Smith, Overland Park; L. N. Speer, Kansas City.

A special committee appointed by Dr. Conrad M. Barnes, president, met and heard Dr. Hood and Dr. Baerg of the Kansas State Board of Health state that a federal law on this subject expired February 15 and that another is before Congress at present. Since the governor of Kansas rejected a program of distribution through pharmacists and practicing physicians and designated the Board of Health to administer the program, the Board of Health therefore bought the entire allotment of vaccine for Kansas and guaranteed that no means test would be used.

The amount of vaccine is determined on the basis of a formula and, regardless of which program was adopted, the total available vaccine to Kansas would be the same.

Kansas immunized according to age groups having the highest incidence of poliomyelitis with the five- to nine-year-old group first and the one- to four-year-old group next. The Board of Health sought to meet the need rather than the demand. There is still and always has been a shortage of supply, and since there are about 50,000 of each age in Kansas, the physicians can then pretty well estimate what the needs will be.

The committee sent certain recommendations to the Council. These were acted upon and appear in the Council reports, primarily to the effect that the position of the House of Delegates as of May 5, 1955,



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is to be reaffirmed, whereby the methods of implementing this immunization program shall be left to the individual county medical societies.

This committee also requested a supplementary report from the Board of Health which was received a few weeks after the committee meeting and is reproduced in full below:

"Since our meeting with the special Polio Vaccine Committee of the Kansas Medical Society on Sunday, February 5, 1956, the following developments have occurred on the national scene. Both the House and the Senate have passed a bill to extend the present Polio Vaccine Assistance Act Funds until July 1, 1957. The President has already signed this bill. The net effect of this action is to allow unexpended portions of the various grants-in-aid which were made in August, 1955, and which would have lapsed on February 15, 1956, to be used for this additional period of time.

"We understand that a second appropriation of 30 million dollars is proposed but have no definite information that this amount has been listed on an appropriation act.

"If no further funds are provided by the federal government, it appears likely that the Kansas polio vaccine program will have expended all of its funds prior to July 1, 1956. If no further funds are appropriated by the federal government, we will no longer

be engaged in the distribution of free vaccine and at that time vaccine will go in commercial channels.

"The above paragraph is based on the conjecture that vaccine continues to reach the state of Kansas at the existing rate of production, and that no additional federal funds are made available for extension of the program to other age groups.

"If additional funds are appropriated we presume something similar to the present program will continue. Major question to be determined would be the exact use of government purchased vaccine (confined to narrow age limits and used for all children in designated group or use for a portion of all children 1-19 and pregnant women).

"In connection with possible alteration in the program now in operation, the Kansas State Board of Health suggests it might be possible to amend the current plan so that a third alternative choice might be available to each county. This alternative would be that the county will agree to make polio vaccine available to all its citizens of the designated age groups through private physicians only, provided the physicians agree to administer the polio immunization to all individuals without discrimination as to financial ability to pay.

"The Board of Health will continue to control the flow of vaccine into areas while the vaccine is in short supply. It will be necessary to see that the vac-

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cine is equitably distributed through the various counties. (Private drug firms do not have equal distribution facilities throughout the state.) Vaccine in commercial channels might conceivably be made available primarily in the big cities, with little or no vaccine in some of the less urban areas. Some control of this from the state level is necessary. In addition, even if all funds were expended, the State Board of Health would continue to designate the age groups eligible to receive the vaccine while vaccine was in short supply. If an epidemic occurred it is conceivable that the State Board of Health might divert supplies to the threatened areas.

"It must be understood that the major unknowns are vaccine production rates and possible action of Congress to extend financial aid to states so that new age groups will be offered the opportunity of free vaccine."

L. E. Leigh, M.D., *Chairman*

POSTGRADUATE STUDY

W. H. Algie, Kansas City, Chairman; A. H. Baum, Dodge City; M. H. Delp, Kansas City; H. S. Dreher, Jr., Salina; G. W. Hammel, El Dorado; E. L. Mills, Wichita; A. C. Mitchell, Lawrence; R. H. O'Don-

nell, Ellsworth; H. P. Palmer, Scott City; F. H. Schiltz, Wichita; Alex Scott, Belleville.

The Committee on Postgraduate Study will meet with a committee from the University of Kansas School of Medicine on March 25 to consider postgraduate studies for 1957.

W. H. Algie, M.D., *Chairman*

PUBLIC POLICY

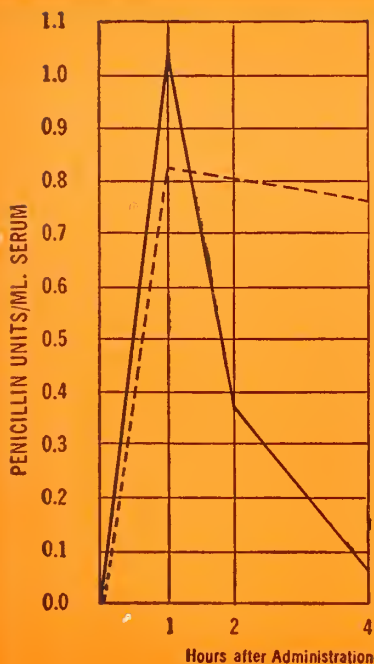
A. C. Armitage, Hutchinson, Chairman; D. A. Bitzer, Washington; J. A. Butin, Chanute; O. W. Davidson, Kansas City; C. W. Miller, Wichita; L. S. Nelson, Sr., Salina; H. F. O'Donnell, Wichita.

This committee is charged with creating interest in good citizenship. It is the responsibility of every physician as an enlightened citizen to take an active interest in the establishment of sound legislation toward the end that health laws locally, state-wide, and on a national basis will serve to protect the public for whom they are designed.

Details of this effort will occupy more space than is available in these pages. Your chairman begs leave to make a supplementary oral report to the House of Delegates.

A. C. Armitage, M.D., *Chairman*

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PUBLIC RELATIONS

F. T. Collins, Topeka, Chairman; J. O. Austin, Garden City; L. J. Beyer, Lyons; E. S. Brinton, Wichita; A. R. Chambers, Iola; K. L. Druet, Salina; D. E. Eckart, Hutchinson; D. B. McKee, Pittsburg; J. D. McMillion, Coffeyville; C. O. Stensaas, Arkansas City; F. C. Taggart, Topeka; V. E. Wilson, Kansas City.

The Committee on Public Relations had a meeting in Topeka on December 18, 1955.

It was the opinion of the committee that much could be done in local societies to further public relations for the medical profession. It was also felt that this committee should propose a form for accomplishing this purpose, as a guide for local societies in developing their public relations.

After much discussion the following points were acted upon:

1. An outline for formation and function of a grievance committee was proposed.
2. Realizing the importance of voluntary health plans in the practice of medicine, a resolution was passed concerning this program and was referred to the Council for action and recommended referral to the House of Delegates for final action. The resolution read as follows:

WHEREAS, Health insurance is the only effective present day means of budgeting health costs, therefore

Be It Resolved, That this Committee on Public Relations urgently recommend to the Council that a serious study be made toward developing an insurance program issuing to the average Kansan a policy that will pay the physician average fees for his services, and

Be It Resolved, That these average fees be published for public information with the understanding that these are average fees for the average condition to the average patient and that they are not binding upon the profession, and

Be It Resolved, That the Council institute a survey among the county societies to determine the average physicians' fees in Kansas and that the Council then establish a committee to correlate this information and refer it to the House of Delegates for action, and

Be It Further Resolved, That since this appears to be a project of unprecedented public relations value which has the enthusiastic endorsement of many physicians located in many areas of the state and is objected to principally by a minority in one location, the Council should take cognizance of this fact and, acting in accord with the majority preference, begin now to prepare the above recommended program for the House of Delegates to study and vote upon.

3. It was felt that the present medical practice act is obsolete, and a resolution was sent to the Council



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requesting a committee be formed for the purpose of revising the present act as a positive approach to the question of cults and for a positive public relations benefit, and that this act be submitted to the local societies in time for their discussion prior to the annual meeting of the House of Delegates.

4. The importance of a 24-hour call service was emphasized, and each society should assure the public that this service is available.

5. Discussion of a code of cooperation between radio, press, and medicine ensued, but no final decision was made at this meeting. Recommendations will be made later.

6. It was felt that the importance of public service by physicians was not being emphasized to the fullest extent, and it is our opinion that a physician is first a citizen and secondly a physician. Each physician should accept responsibility for community improvement through various civic organizations, church activities, etc.

The above recommendations were sent to the secretary of each county medical society. Another meeting of this committee was planned, but there will not be time to get the report into the JOURNAL for publication. If suggestions are made at this meeting, they will be reported either to the House of Delegates or to the local society secretaries.

F. T. Collins, M.D., *Chairman*

RURAL HEALTH

A. W. Sandidge, Mulberry, Chairman; M. P. Ballard, Delphos; L. E. Beal, Fredonia; V. E. Brown, Sabetha; I. R. Burket, Ashland; G. F. Davis, Kanopolis; T. Dechairo, Westmoreland; L. R. Diehl, Osborne; M. F. Frederick, Hugoton; C. C. Gunter, Quinter; B. Hartman, Kensington; L. C. Joslin, Harper; F. D. Lose, Madison; R. M. Owensby, Mankato; C. E. Petterson, Syracuse; E. F. Steichen, Lenora; C. R. Svoboda, Chapman.

Your Committee on Rural Health met with the Committee on Medical Schools at the office of the dean of the University of Kansas School of Medicine. This meeting is reported by the Committee on Medical Schools.

During the past year this committee has spent considerable time with various farm organizations in an effort to prepare an invitation to the A.M.A. Council on Rural Health to hold its annual meeting in Wichita in 1959. Dr. Conrad M. Barnes, president, and Dr. Thomas Hood, together with the executive assistant, attended the national meeting in Portland, Oregon, in March of this year, at which time they extended an invitation on behalf of this committee and the House of Delegates of the Kansas Medical Society.

The date and place of the 1959 meeting will be

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A. W. Sandidge, M.D., *Chairman*

STORMONT MEDICAL LIBRARY

N. V. Treger, Topeka, Chairman; A. K. Owen, Topeka; O. M. Raines, Topeka; Nathaniel Uhr, Topeka; W. L. Valk, Kansas City.

This committee has performed the usual duties of advising the staff at the Stormont Library with reference to the purchase of periodicals and books. The budget has been very small during this year, and no purchase of any consequence was made.

With the construction of the new state office building, there is to be a considerable shifting of office space in the state house. The legislature has shown considerable interest during the session this winter in pre-empting the space currently occupied by the Stormont Library for a conference room. Should this occur, there appears to be no other available space for the library on this floor. The legislature appears to be planning to move the library to the first floor. This committee is of the opinion this would not benefit the library.

The Stormont Medical Library is directed by the

librarian of the law library. It is the opinion of this committee that the Society should take some effort toward keeping the two libraries adjacent. Should this not be done, there will be a distinct reduction in the services of the Stormont Library. The legislature, although threatening to do so, did not act on this subject in the 1956 session. They undoubtedly will attempt to do so in 1957. This committee recommends to the succeeding Committee on Stormont Medical Library that some effort be made toward keeping the two state libraries at least on the same floor in the state house.

Newman V. Treger, M.D., *Chairman*

STUDY OF HEART DISEASE

L. H. Leger, Kansas City, Chairman; D. R. Bedford, Topeka; E. G. Dimond, Kansas City; C. W. Erickson, Pittsburg; H. A. Flanders, Hays; F. J. McEwen, Wichita; P. W. Morgan, Emporia; G. L. Norris, Winfield; L. O. E. Peckenschneider, Halstead; Maurice Snyder, Salina; D. C. Wakeman, Topeka.

The Committee on Study of Heart Disease, in cooperation with the Kansas State Board of Health, conducted a photofluorographic chest survey among school children in Cowley and Harvey counties. Film-

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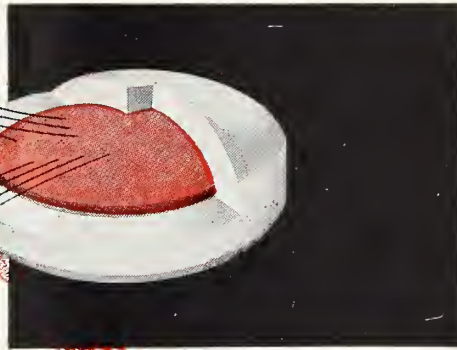
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*Lawrence, W. E.; Kahn, S. S., and Riser, A. B.:
South. M. J. 47:105, 1954.

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ing has been completed and is now being evaluated. A complete report will be made available to the Society as soon as the work is finished.

The committee commends county societies in Kansas which have set up speakers' bureaus to provide information on heart disease to lay audiences. We recommend that county societies not having such bureaus secure the cooperation of the Woman's Auxiliary in establishing such service.

By unanimous vote the committee approved a plan to have a postgraduate course in cardiology on the pattern of those held in previous years in Emporia. Dr. D. R. Bedford, Topeka, was appointed chairman of the 1956 course.

It is hoped that the committee can soon begin a study of heart disease in Kansas. Criteria for this study are now being set up.

The committee would like to see more scientific papers on cardiovascular subjects published in the JOURNAL and solicits such papers from the membership of the Society.

Lee H. Leger, M.D., *Chairman*

VENEREAL DISEASE

A. B. Harrison, Wichita, Chairman; M. L. Bau-

man, Wichita; M. D. McComas, Jr., Concordia; V. M. Winkle, Topeka.

No matters requiring the attention of the committee were reported to the chairman during the past year, so no meeting was held.

A. B. Harrison, M.D., *Chairman*

New Health Exhibits

Scheduled for release this spring are two new A.M.A. health exhibits depicting different aspects of the human body, the eye and the ear. Both will feature life size three-dimension models.

April 1 is release date for the eye exhibit, entitled "We See." Charts and diagrams will show construction of the normal eye, and panels will deal with nearsightedness, farsightedness, and color blindness. Viewers will have an opportunity to check themselves on whether or not they have eye deficiencies.

The second exhibit, available about May 1, is entitled "We Hear." It shows how sound enters the ear and is carried to the brain, and it depicts also the physiology of motion sickness, the mechanics of hearing aids, and information on quackery in the field.

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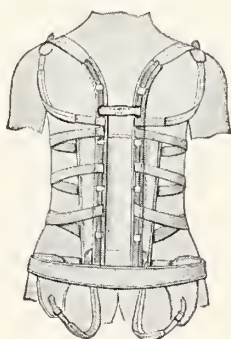
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^{**}Clinton, M., Round Table Discussion: New York J. Med. 54:481, 1954.
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Blue Shield

The Annual Report of the President of the Kansas Blue Shield Plan

The year 1955 produced the largest membership gain for any single year in the history of Kansas Blue Shield. Membership was increased from 385,021 at the end of 1954 to 435,414 at the end of 1955, representing a net increase for the year of 50,393 members.

A total of \$4,881,684.09 was received in membership dues for the period. Of this amount, \$3,644,308.76 was paid to participating physicians for services rendered Blue Shield members.

Operating expenses for the year amounted to 12.60 per cent of income or a total of \$615,010.55.

Approximately \$650,000 was added to reserve during 1955, bringing the total reserve as of December 31, 1955, to \$2,314,609.19. This represents an amount equal to six months case and operating expense.

The Blue Shield Board of Trustees has authorized some additional benefits to Blue Shield members with no increase in costs.

Among these benefits are coverage for radioactive

gold and phosphorus for treatment of cancer, individual consideration of burns treated in or out of the doctor's office with maximum payment of \$100 per case, increasing number of days allowed for hospitalized member from 90 to 120 days, and increased allowances for several surgical procedures. Other new benefits are being studied presently.

Effective April 1, cancer was added to the list of covered illnesses on the Extended Benefits Rider. This will enable Blue Shield to pay up to \$1,500 for treatment of cancer in addition to coverage allowed on the basic contract. Payment will be made on a co-insurance basis, the member paying 25 per cent and Blue Shield paying 75 per cent of doctors' charges.

During the year the Blue Shield board and staff continued work on two new service contracts with income provisions of \$4,500 and \$6,000.

Several meetings were held with the Blue Shield Fee Committee and various specialty groups in an effort to determine average going charges for surgical and medical services.

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Approximately 50 additional meetings were held with district relations committees, county societies, and special groups to explain these proposed contracts and get pertinent suggestions and attitudes of the Kansas doctors.

In February the Council received these proposals and voted to recommend acceptance by the House of Delegates at the annual meeting in May.

Approval of these new contracts will afford Blue Shield an opportunity to offer the people of Kansas a means of prepaying medical and surgical expenses on a realistic basis.

Many participating physicians have given generously of their time in working out details of these new programs.

The cooperation and interest of Kansas doctors have resulted in Blue Shield meeting more public acceptance than any medical-surgical prepayment plan in Kansas.

Higher fee schedules, increased benefits, and a

better extended benefits rider should make Blue Shield even more worthy of professional support in the coming year.

L. W. Reynolds, M.D., *President*

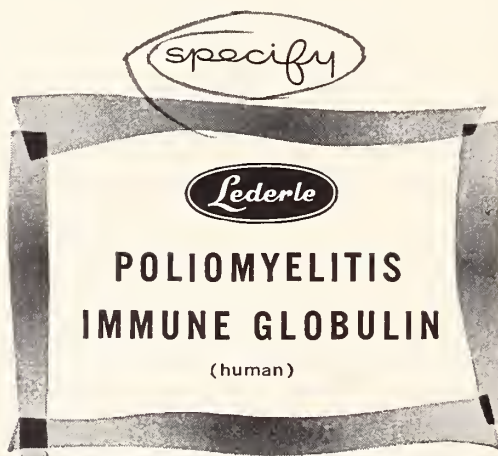
Although there has not been a member of the medical profession in the United States Senate since 1938, there is now at least one physician who is willing to serve in that capacity. Dr. Raymond L. White, a Republican from Boise, Idaho, has announced his candidacy. He has been an alternate delegate from the Idaho State Medical Association to the House of Delegates of the A.M.A. for several years.

"What we need most in Washington," says the Hon. Walter H. Judd, M.D., Minnesota Congressman, "is more doctors in government and, above all, more of the kind of mental habits that good doctors must have."

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TABLE OF CONTENTS

MAY, 1956

Scientific Articles

- Pregnancy and Heart Disease: The Surgical Correction of Mitral Stenosis in the Presence of Pregnancy—John G. Shellito, M.D., and John K. Fulton, M.D., Wichita . . . 267
- Pregnancy and Heart Disease: Mitral Commissurotomy during Pregnancy—Alfred M. Tocker, M.D., Ernest W. Crow, M.D., and Grant E. Evans, M.D., Wichita . . . 269
- Rectal and Colonic Cancer with Special Reference to the Importance of Precursory Lesions—Charles W. Mayo, M.D., and Donald R. Davis, M.D., Rochester, Minnesota 275

- Rheumatic Heart Disease: The Experimental Production of Rheumatic-Like Lesions in the Hearts of Animals—Virginia Lee England Tucker, Kansas City . . . 279
- Clinicopathological Conference: Severe Progressive Constipation of the Newborn . 288
- Epilepsy: The History of Folklore in its Treatment—Senior Thesis . . . 304

Editorials

- The Free Public School . . . 285
- Medical History . . . 285
- Opposition of HR 7225 . . . 285

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Volume LVII

MAY, 1956

No. 5

Pregnancy and Heart Disease

The Surgical Correction of Mitral Stenosis in the Presence of Pregnancy

JOHN G. SHELLITO, M.D., and JOHN K. FULTON, M.D., *Wichita*

We are indebted to Bailey, Glover, and O'Neil,^{1, 2} together with Harkin,¹⁰ for our knowledge of early surgery of the mitral valve.

Glover⁷ has pointed out that organic heart disease, usually rheumatic, complicates 1 to 2 per cent of all pregnancies.

Categorization of patients referable to the severity of their disease has now been established. Group I comprises asymptomatic patients. These are persons with auscultatory findings of mitral stenosis who have no symptoms referable to their disease. There is no enlargement of the heart and there is no specific electrocardiographic change.

Group II consists of patients who have symptoms referable to the heart but have never had congestive failure.

Group III consists of patients who have had congestive failure, who show the signs and symptoms of the Group II patient, but who also have systemic congestive manifestations which can be controlled.

Group IV includes patients who have intractable congestive heart failure due to mitral stenosis.

It is now known that surgery is much better tolerated by patients in Groups II and III than in Group IV. Surgery is not usually necessary in Group I.

To date the number of reported mitral commissurotomies during pregnancy has been small. Cooley and Chapman⁵ reported two cases successfully operated in the fourth month and 36th week of pregnancy, respectively. Baker et al.³ reported three cases,

Editor's Note. This article and the one following were, through coincidence, received by the Journal at almost the same time and are being published together even though they do not necessarily reflect identical ideas. The problem of the pregnant woman with a complicating mitral stenosis is discussed, with consideration of a possible surgical attack on the heart lesion rather than therapeutic abortion or continuation of a complicated pregnancy.

one performed in the third month and two in the 28th week. Watt, Bigelow, and Greenwood¹³ reported seven cases operated on during the first or second trimester of pregnancy. Three had been delivered at the time of the report, and all had shown "continued improvement" in cardiac status following the operation.

Glover et al.⁷ published a report of their experience with five mitral commissurotomies during pregnancy. Four of the patients delivered normal infants following commissurotomy. One of the five patients had a spontaneous abortion six weeks following surgery. All were improved in the postpartum period.

The decision to undertake mitral commissurotomy during pregnancy is not to be lightly considered. In cases thus far reported the indications have not always been clearly outlined. The preoperative condi-

From the Departments of Surgery and Internal Medicine, Wichita Clinic, Wichita, Kansas.

tions of those described by Watt et al.¹³ are not given in detail. One had had repeated episodes of failure and hemoptysis before her pregnancy. The patient reported by Cooley and Chapman⁵ had been in congestive failure shortly before the procedure. Rhythm was regular and the response to a preparatory medical regimen had been good. Each of the three patients reported by Baker et al.³ had been subject to attacks of pulmonary edema either before or after onset of pregnancy. These authors advocate mitral commissurotomy as an emergency measure if intractable failure occurs in the second or third trimester of pregnancy.

Alternatively, medical management must be evaluated as to its efficacy and safety in dealing with the situation. Mortality from medical management of Grade II cardiacs followed by MacRae¹¹ was 1.4 per cent, utilizing bed rest in management and digitalis, salt restriction, and diuretics when necessary. Barry⁴ reported a maternal mortality of 0.37 per cent in his Grade II cardiacs and a figure of 1.42 per cent in Groups III and IV. Hamilton⁹ reports a mortality figure of 3 per cent, and Stromme and Kuder¹² report a figure of 1.3 per cent. Such statistics speak well for medical management in most instances where pregnancy is complicated by cardiac disease.

Mortality in large series of mitral commissurotomies is usually stated to be 6 per cent. On statistical grounds, mitral commissurotomy is not the treatment of choice for the usual case of mitral stenosis associated with pregnancy. It is also doubtful, in view of the above figures, that therapeutic abortion is often indicated on the basis of anything but the most severe and intractable cardiac disease. It should be pointed out that older series on mortality of the cardiac patient in pregnancy gave maternal mortality figures as high as 18 per cent for Grade III patients. With modern meticulous attention to sodium restriction, rest, diuretics, and digitalis, the figure has been much improved, as the several mentioned series indicate.

The decision to perform mitral commissurotomy on our patient was reached on the basis of several considerations: (1) She was considered an ideal candidate for the procedure, had pregnancy not been present; (2) Her previous pregnancy had been marked by complete disability with repeated hemoptyses; (3) When non-pregnant, her compensation was excellent without restriction of activities, and (4) Economically she was unable to provide for herself the required rest and other attentions necessary for adequate medical management.

CASE REPORT

Mrs. G. L., C-107,401, 24-year-old white gravida III, para IV, was first seen in the first month of pregnancy. During her last pregnancy 18 months

previously she had had ankle edema, ease of fatigue, occasional hemoptyses, and marked dyspnea to such a degree that she was bedfast during the entire pregnancy. Two weeks postpartum she had regained her usual exercise tolerance and was able to climb stairs without dyspnea. She first suspected pregnancy when she noted the return of dyspnea and fatigue. Physical findings showed a normal rhythm, slight cardiac enlargement, a prominent systolic and presystolic thrill at the apex, and an easily palpable thrust synchronous with P2 at the base. Typical rumbling diastolic and soft systolic murmurs, together with a loud snapping first apical and loud second pulmonic sound, were heard. The blood pressure was 100/60 mm. There was no edema or distention of the neck veins.

On December 1, 1954, utilizing the usual antero-lateral incision through the bed of the resected fourth rib, the chest was opened. When the auricular appendage was touched there were immediate aberrant contractions of the cardiac musculature. Procaine was utilized for the insertion of the purse string suture, and some intravenous procaine was given by the anesthetist. Entrance to the left auricle was via the appendage in the classic fashion. A typical mitral stenosis was found, having an opening approximately the size of the head of a kitchen match. The antero-lateral commissure was thoroughly split and dilated to the edge of the valve ring. The posterolateral commissure was not split or cut.

Pathological examination of the resected portion of the auricular appendage demonstrated a small Aschoff nodule.

The patient stood the procedure well and was dismissed from the hospital nine days postoperatively. She has since been delivered of a normal infant without difficulty or evidence of cardiac failure.

Most certainly the case reported is not representative of what is to be expected of mitral commissurotomy as a procedure of choice for mitral stenosis encountered during pregnancy. Some will have large hearts with weakened myocardiums, some will have irreversible pulmonary changes, some will have auricular fibrillation, calcified valves, or previous history of embolization suggesting that the mortality from mitral commissurotomy would exceed the expected benefits. Many others, while having undoubted mitral stenosis, will tolerate pregnancy without marked difficulty, as was the case with this patient in her first two pregnancies.

COMMENT

1. Uncomplicated pregnancy associated with mitral stenosis is not a contraindication to commissurotomy.
2. The commissurotomy should be done during the first trimester of pregnancy, if possible.

3. Mitral commissurotomy during pregnancy should be reserved for those patients who otherwise would require therapeutic abortion. These are patients who can be expected to develop intractable failure or hemoptysis or cannot cooperate with a medical regimen.

4. Cardiacs who can be expected to remain in category I or II during pregnancy may delay commissurotomy until after delivery, if it is then indicated.

The Wichita Clinic
3244 East Douglas
Wichita, Kansas

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Pregnancy and Heart Disease

Mitral Commissurotomy during Pregnancy

ALFRED M. TOCKER, M.D., ERNEST W. CROW, M.D.,
and GRANT E. EVANS, M.D., *Wichita*

Although mitral commissurotomy is now widely accepted and firmly established as a standard surgical intervention with low mortality and good results, the utilization of this procedure in the pregnant woman presents special problems. There are now numerous short reports of mitral commissurotomy during pregnancy^{9, 25} which have shown that the hazards of mitral surgery are more apparent than real. These have proved that even in severe cases of mitral stenosis, pregnancy need not invariably be terminated. Since the long term results of the operative procedure itself, as well as its relation to pregnancy, will not be known for perhaps another decade, policies with regard to utilization of this surgical procedure under such circumstances must be tentative.

Asymptomatic lesions, often unknown to the patients, are discovered during routine prenatal physical examinations. In about half the cases so discovered in one clinic, the patients were not aware of the ex-

istence of the disease.⁷ The effectiveness of case finding in this group of patients is further enhanced by the effect of pregnancy in making the signs of heart disease more obvious. Obstetrical patients with borderline indications for surgery, if they can be carried through their pregnancies safely, will often show a minimum of signs and symptoms in the non-pregnant state.

Yet the fact must be kept in mind that in the practice of obstetrics, heart disease is one of the leading causes of maternal morbidity and mortality. Organic heart disease complicates 1 to 2 per cent of all pregnancies¹¹ and accounts for about 25 per cent of all maternal deaths.⁶ Ninety per cent or more of the cardiac lesions that occur in pregnant women are attributable to rheumatic etiology,²¹ and in at least two-thirds of these patients there is involvement of the mitral valve alone, usually with mitral stenosis with or without mitral insufficiency.^{7, 11, 15} Eighty-five per cent of these rheumatic heart disease patients are in functional Class I or Class II²³ (New York Heart Association Classification) and generally tolerate their pregnancies well.

From the Departments of Surgery, Internal Medicine, and Obstetrics and Gynecology, Wesley Hospital, Wichita, Kansas.

In unfavorable cases, maternal mortality approaches 40 to 45 per cent, and cardiac decompensation accounts for 60 to 65 per cent of the fatalities.²¹ This relatively small group of patients with severe mitral stenosis (Classes III and IV) accounts for most maternal mortality, and it is in this group that one must choose between continuation of the pregnancy, interruption by curettage or hysterotomy, or mitral commissurotomy.

Some time ago we were faced with such a decision. It is the purpose of this paper to present this case history and discuss the question, pro and con, of mitral commissurotomy during pregnancy.

CASE HISTORY

Mrs. G. T., a 27-year-old white housewife, was admitted to Wesley Hospital, Wichita, on August 17, 1953, with a diagnosis of threatened abortion and inactive rheumatic heart disease, predominantly mitral valvulitis with stenosis. She was estimated to be approximately in her third month of pregnancy.

Past history revealed that at the age of 12 she had had uncontrollable muscle jerkings and was treated as a bed patient for six months. Since childhood she had been subject to aching of her legs with severe

cramps and coldness of her feet and frequent upper respiratory infections. Her best weight had been 106 pounds some six years previously, and she had lost weight, weighing 84½ pounds on admission. Three times since age 19 she had experienced fainting after undue exertion and had had progressive exertional dyspnea for six years to the point of dyspnea on walking less than one flight of stairs. Slight dependent edema had been present for four years intermittently. Auricular fibrillation appeared in May 1953. She was digitalized April 1953, at which time commissurotomy was first advocated. She stated she always felt tired, whether or not she exerted herself. Although she felt she was able to do her own housework prior to her pregnancy if she took her time, for some time her mother had been doing her housework for her.

The patient was a para I, gravida V. Her first pregnancy had resulted in the birth of a premature infant, who died shortly after birth. Her second and third pregnancies resulted in miscarriages. Her last pregnancy six years ago terminated favorably with the delivery of a male infant weighing 5 pounds and 5 ounces. Although she weighed 104 pounds at the onset of her fourth pregnancy, she weighed only 96

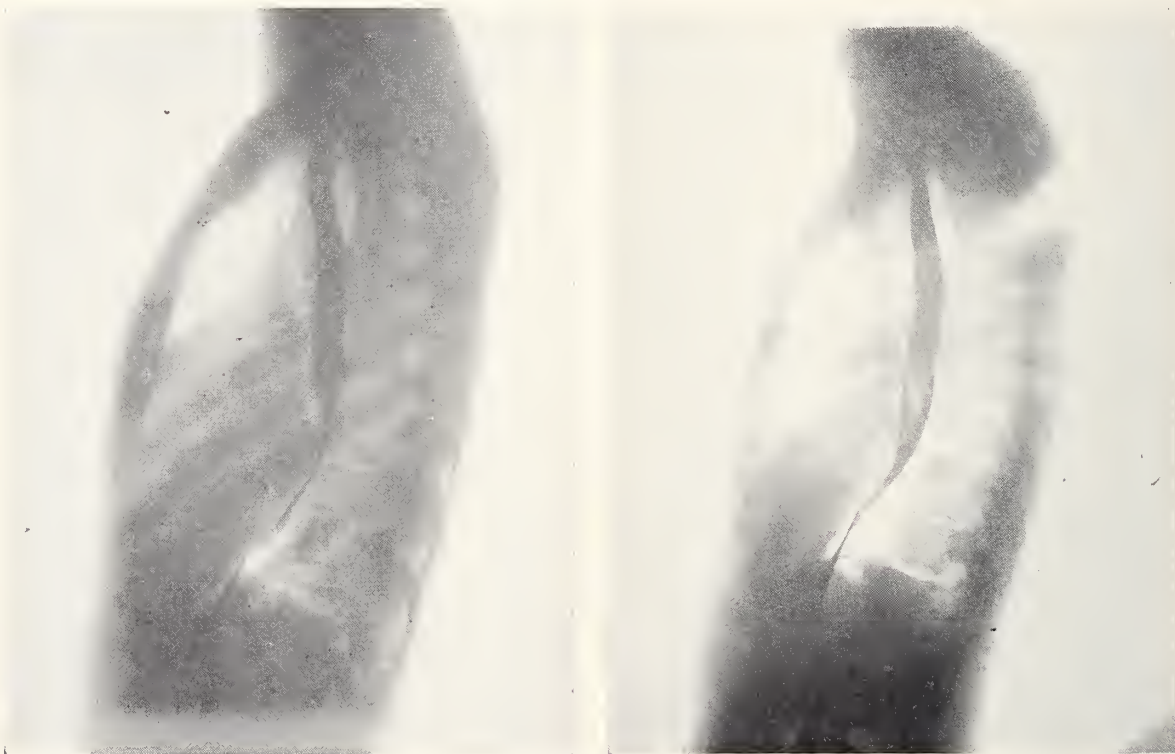


Figure 1

A

B

Lateral x-rays of chest showing diminution in size of left atrium as outlined by barium swallow following mitral commissurotomy (B) as compared with pre-operative film (A).

pounds at the time of delivery. During this fourth pregnancy she had had several episodes of hemoptysis. She and her husband were eager to have another child.

At the time of admission she was experiencing vague lower abdominal and flank pains and was bleeding vaginally. She exhibited a Grade II low-pitched, soft, rumbling, diastolic murmur over the apical and mitral areas. Blood pressure was 90/60. The second pulmonic sound was accentuated. Electrocardiogram revealed digitalis effect, flutter-fibrillation, and right heart hypertrophy. Fluoroscopy and x-ray revealed an increased transverse diameter of the heart with definite enlargement of the left atrium (Figure 1A).

With the threatened abortion controlled, decision was made to perform mitral commissurotomy rather than to permit continuance of the complicated pregnancy or to perform a therapeutic abortion. The operation was performed on August 22, 1953. At operation, numerous pleural adhesions were encountered. The pericardial sac was unusually tense, and incision into the pericardial sac released a moderate amount of fluid. The enlarged left atrium of the fibrillating heart was entered through its auricle. Digital exploration revealed soft pliable valve leaflets, no calcification being present, with the valvular orifice measuring approximately 0.5 cm. in diameter. The antero-lateral commissure was finger-fractured with only moderate difficulty, and the postero-medial commissure was easily split by a similar maneuver, resulting in an orifice which the operator (A.M.T.) estimated would admit $1\frac{1}{2}$ to 2 fingers. No regurgitation was noted prior to or following the commissurotomy. The left auricular appendage was ligated at its base, partially amputated, and the open end oversewn with continuous fine silk suture. The amputated auricular myocardium showed mild fibrosis with no evidence of Aschoff bodies. A lung biopsy revealed only fibrous pleuritis.

The patient withstood the operation well. However, her convalescence postoperatively was prolonged. Her only serious postoperative complication was an atelectasis of the medial segment of the right middle lobe, which responded to bronchoscopic aspiration. She continued to receive digitalis and was discharged from the hospital on September 6, 1953.

During the remainder of her pregnancy her cardiac status did not become worse; in fact both dyspnea and edema were less than when examined by one of us (E.W.C.) in May 1953, prior to pregnancy. The prenatal course was uneventful.

She was delivered January 31, 1954, after a five-hour labor, of a living female infant weighing 4 pounds and $8\frac{1}{2}$ ounces. Labor was spontaneous with a midline episiotomy. During labor 60 mgm. of nisentil was given and a pudendal block was done for

delivery. During labor, delivery, and immediately postpartum, no signs of cardiac decompensation were noted.

Since delivery her weight has varied from 82 to 89 pounds. The severe cramping of her legs and coldness of her feet which were always present on exertion prior to operation have disappeared completely. Although she continued digitalis, she no longer finds it necessary to remain on a low salt diet. Edema of feet and ankles, which had been present prior to operation, is no longer observed. She is less susceptible to upper respiratory infections. Her exertional tolerance has improved to a point where only hard work tires her. She is able to do all of her own housework, including such tasks as waxing floors, without difficulty. She states that she can walk at a normal rate as far as desired without dyspnea. The mitral murmur, though still present, has been significantly diminished. An electrocardiogram still shows auricular fibrillation with a slow ventricular response. Her blood pressure remains unchanged.

Roentgenological examination reveals evidence of postoperative improvement. The transverse diameter of the heart is still enlarged, but there is some diminution in the size of the left atrium (Figure 1B).

DISCUSSION

The hemodynamic burden of pregnancy, as well as the natural course of rheumatic heart disease, accounts for cardiac deaths during pregnancy. Medical and surgical therapeutic means are available which control many of the factors giving rise to this hemodynamic burden.

These patients must be carefully and frequently observed. The curve of cardiac work in pregnancy, maximum in the seventh and eighth months, must be kept in mind. Often rigid cardiac regimens must be enforced, especially during the critical periods of pregnancy. The major principle is to organize ways and means which limit or restrict the rise in cardiac output, cardiac rate, and total blood volume. Limitation of physical activity, avoidance of emotional stress, proper attention to ectopic rhythms and tachycardia, digitalization, limitation of sodium intake, the avoidance of infusions or transfusions which may increase the blood volume, and proper attention to other factors (such as anemia, obesity, infections, and hyperthyroidism) are necessary. The severity of the heart disease, the age of the patient, the history or occurrence of heart failure, and the possibility of adequate supervision and accurate management must also be taken into consideration. It is generally felt that operation is not indicated in patients falling into functional classes 1 and 2.⁹

In cases in which the mitral valve is so tight and the patient's cardiac reserve so severely compromised

that no amount of supportive therapy will compensate for the load of pregnancy (Classes 3 and 4 patients), interruption of pregnancy or mitral valvulotomy must be considered. The demonstrated effectiveness and low mortality of this surgical procedure should give it priority over interruption of pregnancy. Patients with a history of doing badly from a cardiac standpoint during previous pregnancies, or who develop pulmonary edema in spite of adequate medical treatment early in pregnancy, should be offered this operation.

According to a recent report covering a period of 15 years, therapeutic abortions have varied from one abortion per 166 deliveries to one abortion per 357 deliveries in the average teaching hospital.¹⁹ Cardiac cases account for 15 to 20 per cent. Approximately 85 per cent of these abortions for cardiac disease were in patients with pure mitral stenosis or combined lesions due to rheumatic infection.¹⁹ Glover et al.⁹ postulate that since the number of therapeutic abortions for tuberculosis has decreased, while the number for cardiac disease has remained nearly the same, this percentage in recent years has doubled in proportion, making it 30 to 40 per cent of all cases. In their recently reported series of 500 mitral commissurotomies, 1 per cent of the cases were operated upon during pregnancy without mortality and with improvement in all.⁹ These patients would ordinarily have been considered for therapeutic abortion.

Proper judgment in selection or rejection of cases for surgery requires an understanding of the pathophysiological mechanisms of the cardiac disease and the physiological mechanisms of pregnancy, individually and combined.

PHYSIOLOGICAL CHANGES DURING PREGNANCY

Certain physiologic changes have been shown to take place in pregnancy, a knowledge of which is important in evaluating and managing the cardiac patient who is pregnant.

1. Oxygen consumption progressively increases during pregnancy to a maximum of 25 per cent above the non-pregnant state.²¹ This results from increased demands of the pregnant uterus and fetus.^{7, 26}

2. There is an increase in the respiratory ventilation volume relatively greater than the increase in oxygen consumption resulting in a lowering of alveolar and blood CO₂ partial pressures.⁷

3. Cardiac rate, pulse pressure, and venous pressure (in the legs) are increased during normal pregnancy.²⁶

4. Total blood volume increases up to 50 per cent during pregnancy, a fall in hematocrit resulting from a relatively greater increase of plasma volume than red cell volume. The volume increases up to about

the eighth month, and then decreases as term approaches.

5. Cardiac output increases to a maximum of 50 per cent in about the 32nd week, being achieved by both an increased heart rate and stroke volume.

6. The placental site contains large arteriovenous communications which add further to the increased cardiac load.

7. Labor itself adds considerably to the cardiac load by increasing oxygen consumption and cardiac output.

8. Cardiac decompensation occasionally occurs 24 to 72 hours following delivery, a phenomenon which has been attributed by some authors⁵ to interruption of the placental circulation and occluding the "shunt" and allowing a transient increase in circulating blood volume.

PATHOPHYSIOLOGICAL MECHANISM OF MITRAL STENOSIS

Mitral stenosis produces changes in the circulation due to obstruction of the flow of blood through the reduced mitral valve orifice. Left atrial pressure rises, and, in the less severe cases, a normal cardiac output may be maintained at rest, but often not during activity. The elevated pressure in the left atrium is necessarily followed by a corresponding rise in pulmonary capillary pressure. In severe mitral stenosis, the diastolic time is not sufficient to permit adequate filling of the left ventricle, and an increase in heart rate further reduces this diastolic time. Thus cardiac output is further reduced, requiring a further rise in the atrial pressure. This vicious cycle is reflected in an elevated pressure in the pulmonary artery, especially during exercise, which may be demonstrable roentgenographically and determined by cardiac catheterization.

COMBINED EFFECTS OF PREGNANCY AND MITRAL STENOSIS

In all pregnant women there is an encroachment on cardiac reserve.¹⁴ Pregnancy imposes an extra strain on an already struggling heart, causing a decreased margin of cardiac reserve and increasing the threat of decompensation. Severe pulmonary congestion, large hemoptyses, attacks of pulmonary edema, and cardiac decompensation are likely to develop.

The normal rise in cardiac output which accompanies pregnancy requires an increased rate of flow of blood through the stenotic valve, necessitating further increase in left atrial pressure. This is reflected in an increased pulmonary capillary pressure. This is further complicated by the elevation of atrial and capillary pressures resulting from the increased blood volume and tachycardia of pregnancy. Thus failure of cardiac output and pulmonary edema are constant

threats to the pregnant patient with mitral stenosis.

In some patients with mitral stenosis, aggravation of dyspnea occurs unexpectedly early—within a few weeks of conception. It has been suggested that this increase in dyspnea may be similar to that commonly noticed in women during the time of menses, and it may be related to fluid retention by hormonal control.¹⁶

It is obvious, therefore, that the physician concerned with these patients must take into consideration all factors—those due to pregnancy, those due to valvular disease, the combined effects of these two, and those changes due to other factors (obesity, anemia, etc.)—in making the best decision for these patients to permit attainment of the obstetrical ideal, a living mother and a living baby, without subjecting both to the dangers of a possibly needless operation.

ARGUMENTS AGAINST OPERATION DURING PREGNANCY

The history of mitral surgery, especially during pregnancy, is recent and requires further evaluation. The normal pregnant woman may exhibit many findings which mimic organic heart disease:^{9, 11} arrhythmias (particularly paroxysmal auricular tachycardia), functional murmurs (heard in 50 to 70 per cent of all pregnant women), increased heart rate, breathlessness, nocturnal dyspnea, orthopnea, and ankle edema (due to venous congestion of the lower extremities). Intrathoracic changes during pregnancy, especially those resulting from elevation of the diaphragm and the lordotic posture of the patient, are suggestive of organic heart disease. These include an increased haziness of the lung bases (suggestive of pulmonary congestion), an illusion of cardiac enlargement, accentuation of the pulmonary conus,²⁰ and bulging of the upper segment of the left cardiac border with retrodisplacement of the esophagus¹³ (mimicking the findings produced by enlargement of the left atrium seen in mitral stenosis). Murmurs that are impressive during pregnancy may, upon postpartum reappraisal, be minimal or even absent.

If the pathological state can be tolerated during pregnancy without too great risk, surgery may prove unnecessary. Pregnancy does not seem to hasten or adversely affect the pathological changes of rheumatic heart disease.¹² Women with mitral stenosis and pregnancy on the whole do well with informed medical treatment. While surgery may be performed successfully and the pregnancy continued to a successful conclusion, most of these women would probably do well without an operation and with adequate medical supervision.

Operative hazards are increased by the combined effects of pregnancy and cardiac pathology. Commissurotomy may reactivate rheumatic fever. Operation,

if indicated upon completion of pregnancy, subjects only one life to the risk of surgery. Diagnosis, even in the best of hands, is uncertain. Regurgitation or multiple valvular disease may exist, and these patients may be subjected to operation without benefit and with increased risk both during and following cardiectomy. The operation does carry some mortality,¹⁰ and even patients with pure mitral stenosis may be made worse by surgery.

The life of the fetus, in particular, is theoretically endangered by operation.² Bouts of cyanosis may occur during the induction of anesthesia or during the surgical maneuvers, which may also give rise to severe hypotension. This hypotension may be temporary or may persist postoperatively for varying periods of time. The fetal arterial blood is believed to maintain the same oxygen tension as the mother's venous blood. Therefore, even slight degrees of hypoxia in the mother's circulation may be reflected in a low venous oxygen tension and consequent extreme hypoxia of the fetus. Death of the fetus and subsequent abortion or miscarriage may result.

ARGUMENTS FOR OPERATION DURING PREGNANCY

Mitral surgery has made childbearing possible for many women heretofore doomed to barren marriage by severe rheumatic disease. Frequently marriages fail to survive because of this factor alone. Even in pregnancy, the results of the operation have been reported generally as good.^{2, 9} Many feel the policy of terminating pregnancy and sterilizing these patients is no longer justified until the valve is actually examined at operation.^{4, 7, 9}

Modern cardiology is not limited to clinical, radiological, and laboratory examination. It extends into the operating room where the final, more complete, and more exact assessment can often be made.^{4, 9} Patients have been subjected to mitral commissurotomy after the pregnancy has been terminated and even after sterilization. Yet experience has shown that the risk of operation during pregnancy is an acceptable one.^{9, 25} During pregnancy the lives of the patient and the unborn child are often in peril, and aggravation of symptoms such as dyspnea or acute pulmonary edema may occur unexpectedly early.

The operation may be performed at any time, even during the period of greatest hemodynamic strain, but it is generally agreed that early operation is preferable.⁹ The earlier in pregnancy operation is undertaken, the sooner benefits accrue before the circulatory burden asserts itself. And, in the event of surgical failure, there will be more opportunity to resort to interruption of pregnancy—when this proves absolutely necessary.

The hormones of pregnancy may have a protective effect against reactivation of rheumatic disease fol-

lowing commissurotomy during pregnancy.⁹ It is our opinion that abortion is less likely to occur after successful operation. Even if the pregnancy is completed successfully without operation, the mother may be left a cardiac cripple, in need of operation, unwilling or unable to leave the care of her child to undergo surgery, and yet less able to care for the child and home because of her cardiac disability. During this time, the cardiac condition in the more severe cases may undergo considerable progressive deterioration.

CONCLUSIONS

Every case of mitral stenosis during pregnancy must be carefully individualized. Supportive therapy, mitral commissurotomy, and occasionally therapeutic abortion may have a place in the treatment of these patients. Ordinarily only patients in Classes III and IV will require mitral commissurotomy.⁹

If, under proper medical care, signs of cardiac decompensation prior to the "safe interlude" preceding delivery do not develop, the outlook is relatively good with improvement in cardiac symptoms during the final weeks of pregnancy. The incidence of heart failure steadily increases in pregnancy up to the 32nd week, but primary failure seldom occurs after that time.²⁴ Labor is usually well tolerated and does not impose an unbearable strain on the heart.

However, in those patients who, in spite of intelligent medical management, develop stubborn congestive phenomena or give promise of doing so (history of doing badly in previous pregnancies in spite of good medical management, poor cardiac status prior to pregnancy, etc.), mitral commissurotomy is often preferable to therapeutic abortion.

Although mitral commissurotomy may be performed at almost any time, even during the period of greatest hemodynamic strain, the earlier in pregnancy it is performed, the better. The cardiac reserve diminishes as the burden of pregnancy increases, and the hazards of operation are progressively greater and its benefits less marked as pregnancy advances. Operation can best be done during the first trimester. The findings of patients in the 16th to the 32nd weeks of pregnancy should be carefully weighed before the operation is offered. It is contraindicated, as a rule, after the 32nd week.⁹

It is the opinion of many, including ourselves, that repeated embolic phenomena call for emergency mitral commissurotomy at any stage in pregnancy.⁹

Mitral commissurotomy is a diagnostic as well as a therapeutic procedure which should be utilized before termination of pregnancy.⁴ Cesarean section or therapeutic abortion is, as a rule, seldom justifiable prior to operation. In many cases improvement will nullify the necessity of terminating the pregnancy.

On the other hand, if cardiectomy reveals a rigid,

calcified mitral valve, moderate regurgitation or a high degree of cardiac enlargement, or if the therapeutic response following commissurotomy is poor (especially in patients over 35 years of age or in those with auricular fibrillation), termination of pregnancy may be justified, in spite of the performance of a technically adequate commissurotomy.⁹ This is also true if other serious pathology is discovered at operation. Thus the findings at operation will enable the cardiologist and the obstetrician to determine whether or not the present and possible future pregnancies are too great a threat to the patient's life.

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Rectal and Colonic Cancer

with Special Reference to the Importance of Precursory Lesions

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When it is considered that 15 per cent of malignant tumors of the human body occur in the anus, rectum, and colon, that 30,000 to 35,000 American people die annually of this disease, and that approximately 12 per cent of persons harbor lesions of malignant potentialities in the colon or rectum at some time in their lifetime, impetus is given to efforts advanced for the eradication of precancerous lesions in this region.

We are in agreement with Fansler¹ in his belief that further extension of the surgical attack on cancer of the colon and rectum will offer little in the way of improving our present statistics on salvage. Furthermore, we are of the opinion that greatest improvement will evolve from efforts to detect and eradicate certain premalignant lesions, namely adenomatous polyps of the rectum and colon, familial polyposis, and chronic ulcerative colitis. Thus, it is apparent that the task of improving our present salvage rate is not one that falls only to the skill of the surgeon but, rather, is the prerogative of all physicians actively engaged in the practice of medicine.

It is generally agreed that adenomatous polyps of the colon and rectum constitute one of the most dangerous precursors of cancer known,² and furthermore, this precursor is the most common. In a recent report, Hitchcock and Aust³ reviewed the records of 5,352 men and women examined at the Cancer Detection Center of the University of Minnesota between March, 1948, and February, 1953. They found that 1.7 per cent of these patients were hosts to clinical cancer and

that the colon and rectum were the primary sites of the lesions twice as frequently as was any other organ. Thirteen hundred patients, or 24 per cent of their total group, had precancerous lesions of one form or another. Six hundred twenty-four of these lesions, or

Improvement in cure rates for cancer of the colon and rectum is more likely to result from proper treatment of precancerous lesions than from extensions of our operative procedures. Conditions considered include adenomatous polyps, familial polyposis, and chronic ulcerative colitis.

approximately half, were adenomas of the rectum or colon. This represents an incidence of 11.7 per cent of all persons examined. It is our opinion that all these people, if given sufficient time, ultimately would have clinical cancer and that a portion of them would die of the disease.

Whether or not all cancers of the colon and rectum have their origin in adenomatous polyps has been a much-debated question and, of course, the answer is not known. Jackman and Mayo⁴ outlined the evidence that has accumulated in recent years to indicate that polyps of the colon and rectum are important forerunners of cancer. This evidence, we feel, is worthy of reiteration, as follows: (1) There is a close parallelism between the location of polyps and the location of clinical cancer in the large intestine; (2) There also is significant similarity of age and sex distribution between patients who harbor adenomas and those

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who harbor carcinomas; (3) The frequency with which adenomas and carcinomas are encountered in the same patient is noteworthy; (4) Persons with familial polyposis almost invariably die of cancer of the colon or rectum if they are not treated and if they live long enough; (5) Untreated polyps show malignant degeneration on subsequent examination; and (6) Polypoid disease and subsequent carcinoma are among the most common complications of chronic ulcerative colitis.

Seventy per cent of cancers that involve the large intestine are within reach of the 24-cm. sigmoidoscope. The same is true of adenomatous polyps. Cancer of the colon occurs most frequently in patients between the ages of 30 and 70 years, the so-called cancer age. Again, the same is true of adenomatous polyp. Both adenomas and carcinomas predominate in men in a ratio of 3:2. Eighteen per cent of specimens removed because of carcinoma of the colon have one or more polyps adjacent to the growth, which are commonly designated "sentinel polyps." If it is considered that the remainder of the colon may harbor tiny polyps not visible by roentgenographic means, the actual incidence must be a good deal higher than this.

Buie⁵ has estimated that 25 to 30 per cent of all persons with cancer of the colon or rectum have associated polyps somewhere in the colon, but he has stated that the majority occur close to the growth. Dockerty⁶ is of the opinion that approximately 50 per cent of persons with familial polyposis will die of cancer by the age of 30 years, whereas practically all of them will have advanced abdominal cancer or will die of cancer before the age of 50 years. Buie and Brust⁷ reported on eight patients who had solitary rectal adenomas and refused treatment. In four of these cases, clinical cancer developed at the site of the original polyps during periods ranging from 2 to 10 years. Bacon and associates⁸ studied 800 cases of cancer of the colon and reported that in 90, or 11.2 per cent, there was evidence that the carcinoma had its inception in an adenomatous polyp, and that in an additional 3.7 per cent there was presumptive evidence of such origin. A patient treated by us illustrates vividly the adenoma-carcinoma sequence.

Illustrative Case. A machine operator, aged 52 years, first came to the Mayo Clinic in 1948 because of nervousness and worry about his health. After a satisfactory examination, including digital rectal examination, he was dismissed with a diagnosis of anxiety neurosis. In 1952 he experienced an episode of rectal bleeding and consulted his home physician; proctosigmoidoscopic examination revealed two small polyps in his rectum. Immediate treatment by fulguration was recommended but was refused by the patient. In September, 1954, after two years of procrastination, he was referred to this clinic by his home physician

for treatment of rectal carcinoma. On proctoscopic examination, the diagnosis of annular, ulcerative, obstructive adenocarcinoma, grade 2 (Broders' classification), was confirmed. An operation that was undertaken with hope for a cure revealed extensive hepatic metastasis which involved both lobes of the liver, so only a palliative resection was performed to relieve intestinal obstruction.

Here, then, was a man doomed to early death because of his procrastination in the treatment of rectal polyps. It may seem redundant to emphasize that patients with rectal polyps who delay treatment should be fully informed of the hazard of cancer and, should they persist in refusing treatment, the responsibility should be entirely their own.

Twenty-five years ago it was not believed that cancer ever occurred as a complication of chronic ulcerative colitis. However, since the report of Yoeman,⁹ in 1927, there has been an ever-increasing number of reports in the medical literature connoting its frequency. Bagen and associates¹⁰ recently reported 1,564 cases of chronic ulcerative colitis and attempted to determine the relative frequency with which carcinoma occurred as a complication. They determined that 6.3 per cent of patients in their group died of carcinoma of the colon. Not concerning themselves with the number of cases in which cancer may develop later, they compared the number of deaths from cancer in their group with the expected number of deaths from cancer of the colon in the normal population, utilizing death rates supplied by the United States Public Health Service. They concluded that cancer of the colon and rectum develops 30 times as frequently in persons who have chronic ulcerative colitis as it does in individuals of similar age groups in the general population.

It has been noted that the incidence of malignancy is greater in persons afflicted with chronic ulcerative colitis at an early age; that in this group of patients the grade of malignancy usually is high; that the lesions frequently are multiple, and that the outlook for these patients is extremely grave. Of 73 patients studied by Shands and associates¹¹ and subjected to operation with hope for cure, only two lived for five years and one of these subsequently succumbed to carcinoma.

Having presented evidence illustrating the serious danger of cancer associated with adenomatous polyps, familial polyposis, and chronic ulcerative colitis, we are confronted with the problem of how we might deal with these conditions to advantage from the aspect of prevention of cancer.

ADENOMATOUS POLYPS

It is fundamental that physicians and surgeons should be aware of the high incidence of polyps in seemingly normal persons. In evaluating the advantage

of routine proctosigmoidoscopy, Hauch and associates¹² reviewed the records of 1,919 patients who had had no symptoms referable to the anus or gastrointestinal tract. They found that 8.1 per cent of this group had adenomas of the rectum or sigmoid colon. Baggenstoss,¹³ in a study of 2,784 necropsies in which death was attributable to diseases not related to the colon, found that 14.7 per cent of the men and 9.0 per cent of the women had polyps in the large intestine. In view of the fact that one in 10 patients more than 40 years of age has polyps that are visible through the 24-cm. sigmoidoscope, the "polyp-conscious physician" can render a great service to his patients by finding and destroying these lesions in their early stages of development.

Medical schools, hospitals, and teaching clinics are urged to familiarize students with the proper handling of proctosigmoidoscopic equipment and to teach with emphasis the value of adequate examination of the rectum and terminal portion of the colon. Practitioners not fully acquainted with the technic of proctosigmoidoscopic examination should take time off from their busy practices to observe and learn this technic so that they may render this service to their patients. We feel that every patient who undergoes a routine examination and is 40 years old, or older, should be subjected to proctosigmoidoscopic examination and, perhaps, to x-ray examination of the colon.

Once a polyp has been discovered, its immediate removal is mandatory. The size of the growth gives no indication as to whether or not malignant change has taken place, nor can it be predicted when a given polyp will undergo malignant change. It is not possible to tell, by gross inspection, which polyps are benign and which are malignant; microscopic study is necessary to determine their true nature. Once a polyp has been discovered and treated, either by fulguration or by surgical removal, the patient should be instructed to watch carefully for signs of rectal bleeding. Also, he should have a proctoscopic examination and barium-enema study at least once a year thereafter. It has been shown that in approximately 20 per cent of cases, additional polyps develop after fulguration of rectal polyps, and that in 30 per cent of cases additional polyps develop after transcolonic polypectomy. The necessity for careful follow-up is therefore obvious.

FAMILIAL POLYPOSIS

Total abdominal colectomy is the only safe treatment for familial polyposis, in view of its serious malignant potentialities. This view is universally accepted. In general, we follow one of two approaches to the problem, depending on the presence or absence of cancer of the rectum.

In the presence of cancer of the rectum, we prefer to carry out total abdominoperineal resection with

establishment of a permanent ileac stoma. The node-bearing tissues along the superior hemorrhoidal and inferior mesenteric vessels are removed en bloc, as in any other adequate operation for cancer. We prefer either skin-grafting the ileac stoma or cuffing it with mucous membrane, believing they offer certain advantages to the patient.

In the absence of cancer of the rectum, provided the rectum is not diffusely and completely involved with polyps, total abdominal colectomy with preservation of the rectum and ileorectostomy is the operation of choice. Polyps in the rectal remnant are fulgurated through the sigmoidoscope prior to or at a propitious time after the operation. We prefer one-stage resection with primary end-to-end anastomosis because of certain technical advantages to both the patient and the surgeon, as well as great economic saving to the patient.

Follow-up examination of the rectum in the years after operation is extremely important and must be emphasized to the patient; we advise it be done every six months. In practically 100 per cent of patients additional polyps develop, and these will require fulguration. Black and Hansboro¹⁴ found that, of 26 patients, all but one had polyps in the rectum that required fulguration each year for four years after operation. Total colectomy with ileorectostomy will be successful only if the polyp-bearing rectal remnant is examined periodically and indefinitely.

CHRONIC ULCERATIVE COLITIS

Because cancer develops 30 times as frequently in patients with long-standing chronic ulcerative colitis as in persons not so afflicted, it behooves the attending physician to observe these patients carefully for polypoid change and for symptoms suggestive of supervening malignancy. Opinion is widely divided as to the proper method of dealing with this condition. There are those who advocate total colectomy with permanent ileac stoma in every case as soon as the diagnosis has been established definitely. On the other hand, others adhere to a more conservative view, resorting to operation only in the event of definite indications, such as severe intractability, hemorrhage, polypoid change, or malignant degeneration.

In general, the problem of selecting patients for operation has not been standardized. In view of the great number of patients who have been treated successfully by medical means alone, we are convinced that routine total colectomy with ileostomy borders on the unjust and that surgeons should maintain an open mind, weighing carefully the question as to whether surgical treatment is necessary to return the patient to a useful life. We have leaned toward the conservative school in the treatment of chronic ulcerative colitis, but we feel that all patients, with or without ileostomy, should be examined periodically, with re-

view of their histories and with laboratory studies, proctoscopic examination, and barium-enema study of the colon to detect any supervening malignancy at the earliest possible moment. In reviewing the management of this disease at the Mayo Clinic, we found that total colectomy has been performed three times more frequently for chronic ulcerative colitis after 1940 than it was prior to 1940. We do total colectomy in approximately 12 per cent of cases at present.

With reference to polyps complicating chronic ulcerative colitis, those within reach of the sigmoidoscope should be fulgurated, preferably during a remission to avoid flare-up of the disease, and those above the proctoscopic level should be checked frequently by roentgenologic and fluoroscopic examinations to detect any change in size. Should a polyp show enlargement on successive examinations, the intervention of malignancy should be seriously considered and the patient should undergo total colectomy.

SUMMARY AND CONCLUSIONS

1. Early detection and eradication of precancerous lesions rather than further extension of our operative attack will improve our present salvage rates in carcinoma of the colon and rectum.

2. Adenomatous polyps in the colon and rectum are important forerunners of cancer and should be removed. One person in 10 past the age of 40 will have polyps visible through the 24-cm. sigmoidoscope.

3. Total abdominal colectomy is the only safe treatment for familial polyposis, and successful surgical treatment after ileoproctostomy hinges upon adequate follow-up and treatment of the rectal remnant.

4. Persons with chronic ulcerative colitis have cancer of the colon and rectum 30 times as frequently as do persons not so afflicted. Periodic review of the patient's history, physical examination, laboratory studies, proctoscopic examination, and barium-enema studies will determine the question of medical or surgical therapy.

5. A plea is made for medical schools, hospitals and teaching clinics to familiarize their students with

the proper use of proctoscopic equipment. Busy practitioners should take time away from their practices, if need be, to learn how to perform an adequate proctosigmoidoscopic examination.

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People sometimes refer to higher education as the higher learning, but colleges and universities are much more than knowledge factories; they are testaments to man's perennial struggle to make a better world for himself, his children and his children's children. This, indeed, is their sovereign purpose. They are great fortifications against ignorance and irrationality; but they are more than places of the higher learning—they are centers and symbols of man's higher yearning.

—W. H. Cowley

Rheumatic Heart Disease

The Experimental Production of Rheumatic-Like Lesions in the Hearts of Animals

VIRGINIA LEE ENGLAND TUCKER, *Kansas City*

INTRODUCTION

Reproduction of characteristic heart lesions of rheumatic fever in experimental animals has been the subject of much research and speculation particularly concentrated in the past 25 to 30 years. Demonstration of the heart lesions of rheumatic fever in experimental animals is essential to the establishment of etiological factors and the treatment of the disease. Outranked only by tuberculosis and syphilis, rheumatic fever is the third most common serious infectious disease in this country. It is the foremost cause of death in individuals below the age of 20.⁵ Before measures of prevention and control can be established, an experimental model must be reproduced.

Historically the definitive signs of the disease have been observed with sufficient frequency to enable some basis for judgment and analysis of experimental results.

In 1805 J. Haygarth⁸ led the research in the field by the observation that clinically these lesions were a "cyanche, a not uncommon antecedent of attacks of rheumatic fever."

The microscopic requirements of the lesions in the acute phase of the disease were described by L. Aschoff¹ in 1904. His classic description of Aschoff bodies as specific lesions of rheumatic fever has been the measuring device for the production of the disease in the heart experimentally.

An attempt to formulate the lesions demonstrated in the heart to a pathogenesis of a disease process was made by Shick²⁵ in 1907. The essence of his suggestions related the endocarditis to an "eminent allergic sequelae" of rheumatic fever.

The etiologic factor of the disease was defined by A. F. Coburn³ in 1931. A hemolytic streptococcus was considered to be implicated in epidemiological and bacteriological studies of rheumatic fever patients.

Rebecca Lancefield¹³ did much to restrict the etiological agent to a specific organism by demonstrating that Group A streptococcus was serologically specific for man.

The purpose of this paper is two-fold: (1) to review the experimental work which has been done in the production of the heart lesions characteristic of

rheumatic fever, (2) to analyze the positive and negative findings in experimental animals simulating the heart lesions of rheumatic fever. A complete review of the literature has not been made. It is felt, however, that an adequate sampling of the representative types of experimental work sufficient to illustrate the major trends on the subject of the paper has been accomplished.

REVIEW OF EXPERIMENTAL WORK

The experimental work which has been done in the production of rheumatic heart disease in animals can arbitrarily be placed in five categories based on theories pursued by investigators concerning the pathogenesis of rheumatic fever. They are as follows: (1) a hypersensitive reaction to hemolytic streptococcus, (2) the effects of trauma or stress placed on the heart with a superimposed streptococcal infection, (3) the effects of nutritional deficiency with a superimposed streptococcal infection, (4) the synergistic effects of

Before an experimental research animal can be said to demonstrate the changes and cardiac lesions of rheumatic fever, the complete course of the disease should be observed, not just the more obvious initial stage. In order to accomplish this, the experiment must be maintained for long enough periods of time that animals can demonstrate these lesions.

streptococcus and vaccinia virus, and (5) an immune reaction based on a parasite-host response mechanism.

The first category concerns experimental work based on the assumption that lesions found in the hearts of rheumatic fever patients result from a hypersensitive reaction.

McKeown¹⁵ induced a hypersensitive response in the hearts of rabbits by repeated injections of horse serum. Microscopically, the tissue response to sensitization by horse serum was evidenced by focal necrosis of collagen in perivascular tissue, interstitial septum of the myocardium, and fibrous tissue formation on the valve rings and valves. The inflammatory re-

Mrs. Tucker is a student at the University of Kansas School of Medicine. This paper was written during her sophomore year at the school.

sponse of the myocardium and perivascular region was felt to simulate Aschoff nodules.

Kirschner and Howie,¹² using rabbits, repeated the work of McKeown. However, they enlarged the experiment to include not only the hypersensitive response to horse serum but also any apparent synergistic effects that might be present from multiple injections of horse serum and killed streptococci. A third group of rabbits was given multiple injections of Group A hemolytic streptococci. Cardiac lesions were observed to vary only in degree of severity in cases where streptococci were used. Incidence of lesions within a group was approximately the same in all three groups of rabbits.

Robinson²³ used both monkeys and rabbits, but soon abandoned monkeys since only mild carditis could be produced. The intent of his experimental work was to demonstrate the cardiac lesions characteristic of rheumatic fever were related to a hypersensitive response rather than to an infectious process. He made comparative studies of groups of rabbits given repeated inoculations of Group A streptococci, single inoculations of streptococci, multiple injections of diphtheroids, heated mouth washings of rheumatic patients, and unheated mouth washings of rheumatic fever patients. The most severe cardiac lesions were produced in rabbits subjected to multiple injections of Group A streptococci. Although he had no evidence of such experimentally, he felt that the factor responsible for the lesions was a "heat-labile, non-antigenic factor, a toxic albumin—bacterioplasm," a specific toxin of streptococci.

Murphy and Swift¹⁹ did a series of experiments over a two-year period attempting to produce a rheumatic fever-like state in rabbits by successive focal injections of heterologous types of Group A streptococcus. The rabbits were observed from three to 20 months before being sacrificed. The heterologous streptococcus under the circumstances of the experiment produced lesions more typical of human rheumatic fever than had previously been demonstrated.

Schultz and Fite²⁴ sensitized rabbits with an initial intravenous injection of acacia followed by multiple injections of serum derived from rheumatic fever patients. The animals were sacrificed in three months after approximately seven to 12 injections. Vascular lesions similar to those rather characteristically seen in cases of human rheumatic fever were observed. Other findings were regarded as equivocal.

Thomas and Stetson^{28, 29, 30} induced a generalized Swartzman reaction in rabbits which resulted in valvular, perivascular, and myocardial lesions of the heart. Coronary vessels were observed to undergo fibrinoid necrosis. Deposits of fibrinoid occurred on the mitral and aortic valves, principally on valve surfaces. Affected valves displayed fragmentation of the ground

substance. Often encountered in the vicinity of blood vessels were areas of necrotic myofibrils infiltrated by mononucleated inflammatory cells possessing basophilic cytoplasm and characteristic "owl-eyed" nuclei.

Instead of giving streptococci as the preparatory and provocative agent in producing the generalized Swartzman reaction, Thomas, Denny, and Floyd³¹ produced similar lesions in the heart by using streptococci as the preparatory agent and meningococci as the provocative agent. No cardiac lesions were produced using meningococci alone.

The second category concerns experimental work based on the assumption that lesions may be produced by trauma or stress placed on the heart with a superimposed streptococcal infection.

Lillehei, Hammerstrom, Wargo, and Clawson¹⁴ produced bacterial endocarditis by surgically producing A-V fistulas in dogs followed by intravenous injections of Group D hemolytic streptococci. A similar procedure was followed in a second group of dogs except that after septicemia had been established, a series of antibiotics was administered. In the six animals in the first group of dogs not receiving antibiotics, 100 per cent developed bacterial endocarditis. In the second group, dogs receiving antibiotics, endocarditis was produced in four of the five dogs tested. The mitral valve was most frequently involved.

By subjecting rats to the equivalent of an altitude of 25,000 feet, Highman and Altland¹⁰ produced fibrinous nodules on the heart valves of rats. Having produced the initial lesions, they were able to produce bacterial endocarditis, particularly valvulitis on the mitral and aortic valves. They used a variety of organisms isolated from cases of human bacterial endocarditis.

The third category, the effects of nutritional deficiency with a superimposed streptococcal infection, was demonstrated by Rinehart and Mettier.²² They were able to show a degenerative and proliferative valvular lesion in the hearts of scorbutic guinea pigs by infection with Group A hemolytic streptococcus. The limiting factor of this experiment is that similar lesions were evidenced with organisms other than streptococci.

The fourth category, the synergistic effects of streptolysin O and vaccinia virus, was observed incidentally in an experiment designed specifically for the induction of rheumatic and rheumatoid arthritis. Sokoloff and Beegel²⁶ noted a high frequency of "viral carditis" in rabbits receiving injections of streptolysin O and vaccinia virus. The lesions were characterized by myocarditis and acute mitral valvulitis.

The fifth category, an immune reaction, was proposed by Calvert.² He attempted to demonstrate experimentally in rats that the lesions of rheumatic fever result from the ability of streptococcus to combine

with substances of heart tissue. The streptococcal-tissue substance union acted as an antigen, resulting in the production of auto-antibodies by the tissues to this antigen. The combination of this auto-antibody and antigen led to the damage of these tissues. Emulsions of heart tissue and connective tissue were used respectively with soluble streptococcal protein and ether killed streptococcus. The most typical lesions were produced by heart and connective tissue emulsions. Connective tissue involvement was characteristic of both cases.

RESULTS OF EXPERIMENTAL WORK

In all cases reviewed, endocarditis was produced. The question still remains, "Have the identical lesions of human rheumatic fever been duplicated experimentally?"

The time element in the development of rheumatic phenomena in the course of the disease is important. Three phases plus the possibility of a residuum or sequelae to the disease are outlined by Colburn.⁴ The first phase is associated with infection. Activity is concentrated on an exudative process with varying degrees of intensity. The second phase results in a specific histologic change in the endothelial cells. Collagen necrosis, fragmentation of myocardium, and deposition of fibrin and the trapped serum contents can be demonstrated microscopically. The appearance of the third phase may occur several weeks or months after the onset of the initial infection. A period of quiescence may supersede this phase in which no apparent infection is present. The manifestation of sequelae is obscure but appears in a sizable number of cases. The most striking differences of the reactivity of the patient during the progress of the disease are (1) the primary lesions being associated with infection, and (2) the late lesions being associated with disturbances in metabolism.

Gross and Ehrlich^{6, 7} described the life cycle of the Aschoff body which appears during the early stage of the disease. Since the Aschoff body has been credited as the discrete histological evidence of the primary stage of rheumatic fever, it has been the center of much attention in experimental work on rheumatic fever. Aschoff bodies pass through an orderly sequence of changes ending in an "intrafollicular scar." They appear in sites where collagen is most abundant: "in planes between the myocardial bundles, in fibro-elastic tissue around blood vessels, and in the endocardium." In consequence, the architecture of the Aschoff body is subject to much variation depending on the stage of the disease and the type of tissue in which it lies. Murphy¹⁷ believes he has been able to demonstrate that the Aschoff body arises from injured myofibrils rather than directly from collagen.

Experimental findings which most closely resem-

ble the lesions of rheumatic heart disease are centered on the infectious organism responsible for the primary infectious phase of the disease and the sequence of events which occur during the primary stage. It has not been possible to define the mechanisms or the pathogenesis of the phase of the disease concerned with the "non-suppurative post-streptococcal disorders"²¹ experimentally.

The most typical and consistent results closely simulating the picture seen in rheumatic patients were demonstrated in those animals given repeated injections of the Lancefield Group A streptococcus. The use of heterologous types of Group A streptococcus by Murphy and Swift¹⁹ duplicated human streptococcal infections which have been shown to vary as to serological groups at different times. Dr. Lowell A. Rantz²¹ considered the work of Murphy and Swift,^{16, 19} and Kirschner and Howie¹² to have fulfilled the requirements necessary to say that lesions of rheumatic heart disease have been produced. He said, "Anatomical study of the tissues of these animals (rabbits) revealed lesions indistinguishable from those seen in fatal rheumatic fever in adults. The most severe tissue lesions appear in those animals that responded to later injections of living streptococci by a very vigorous antibody production of the type seen in rheumatic fever in man." The fact that in the case of Murphy and Swift the animals were maintained for a period of three to 20 months certainly made an analysis of the total effects of the disease on the heart in sequential order simpler.

The generalized Swartzman reaction produced cellular thrombi in the myocardium, pericardium, and valves of the hearts of rabbits. Some investigators felt that these thrombi which have been shown to be of leukocyte-platelet origin are as pathognomonic of the disease in the heart as Aschoff bodies. These lesions were shown to be specific to Group A streptococcal infection.²⁷

The results of elevation of rats to 25,000 feet¹⁰ and the stress of inducing A-V fistulas¹⁴ in dogs plus superimposing streptococcal infections revealed other mechanisms which are being studied, having been revised in attempts to produce the changes of rheumatic fever.* Bacterial endocarditis has been produced consistently, but the characteristic effects of rheumatic fever on the heart were not demonstrated experimentally.

Epidemiological studies of the incidence of rheumatic fever reveal that "rheumatic fever occurs most frequently in those sections of large cities in which the economic level is low and standards of living poor."²¹ Credit for the recognition of increased inci-

*Hamilton, T. R.: Personal communication regarding research currently in progress.

dence of rheumatic fever among persons who would most likely be subjected to vitamin deficiencies can be given to Rinehart and Mettier²² for their attempt to produce rheumatic heart disease with hemolytic streptococci in scorbutic guinea pigs. Environmental factors may have more significance than is recognized today.

Experimental data concerning lesions producing "viral carditis" in rabbits receiving injections of streptolysin O and vaccinia virus were not described sufficiently to enable discrete analysis.²⁶

In animals in which Cavelti^{2, 20} was able to produce heart lesions by injection of emulsions of heart or connective tissue with soluble streptococcal protein extracts, results indirectly indicated that an auto-antibody has been produced. A time lag was noted before the lesions were produced. Lesions were present only when an autogenous tissue was used. No reaction in the heart was observed with skeletal muscle devoid of connective tissue. Serological studies were made in vitro with extracts of plain homologous tissue component antibodies demonstrable with serum from animals treated with either heart or connective tissue emulsion and killed streptococci.

DISCUSSION

The basis for evaluation of experimental data on rheumatic fever is placed solely on its contribution to a better understanding of the pathogenesis of the disease. Much progress has been made experimentally as to the infectious agent responsible for initiating the sequence of events. Experimental results have conclusively pointed to Lancefield Group A streptococcus. Why some individuals are susceptible to an attack of rheumatic fever and others are not under similar circumstances of repeated focal infections is unknown. Experimentally it was revealed that there was little consistency among animals concerning the degree of involvement of the heart. Some appeared more resistant than others, although the amount of exposure to infection was well controlled.

The significance of multiple infections or injections, as the case may be, appears significant both clinically and experimentally. In all cases of experimental success in producing some type of heart lesion, a sensitizer was required whether it be horse serum, a virus, trauma, or an initial dose of streptococcus. The logical conclusion would equate the disease to either a hypersensitive or immune reaction which requires a characteristic pattern of response to stimulation on the part of the host tissue.

The presence or absence of Aschoff bodies has been the cause of much debate among investigators at the experimental level. Murphy and Swift^{18, 19} claim to have produced in rabbits the identical microscopic

picture of Aschoff bodies seen in humans. Other workers have described swollen collagen fibers surrounded or infiltrated with "owl-eyed" cells. Hamilton and Syverton⁹ have described the origin of these cells as tissue mast cells brought into play during the first phase of the disease. A host response to insult results in alteration of the appearance of these cells by "degranulation." Although experimental work is not conclusive that this is the case, they suggest that deficiency in this granular material may be important.

Gross and Ehrlich^{6, 7} have outlined a life cycle of the cell which indicates that variation in appearance of the Aschoff body can exist in patients, depending on the stage of the disease at the time they are presented for autopsy. Group A streptococcus is a natural pathogen for man, not experimental animals. Therefore, tissue response may vary because of altered reactivity of animal tissue cells to a foreign pathogen, or to the stage of the lesion at which the observation was made. Aschoff¹⁹ has emphasized the importance of applying the same etiological stimulus to different species of animals and comparing responses if one is to establish common cause for their responses.

Leukocyte-platelet thrombi in areas of Aschoff or Aschoff-like bodies and in coronary vessels were observed both on patients brought to autopsy with rheumatic heart disease and in experimental animals. Stetson and Watson^{27, 32} demonstrated that the verrucae seen on the valve leaflets consist of "masses of blood platelets with unmeshed leukocytes, erythrocytes, and strands of fibrin" which appear much like "parietal thrombi." The suggestion is that the leukocyte-platelet thrombi and the verrucae on the valves are of common origin.

Experimental work done on animals has contributed significantly to the "phase 1 and phase 2" picture of rheumatic heart disease as outlined by Coburn.⁴ Only until someone has demonstrated the complete gamut of the disease can the production or lack of production of the lesions of rheumatic fever experimentally in laboratory animals be analyzed. The most apparent fault of the experimental work that has been done is the impatience of research workers. The animals have either died or been sacrificed before the stage of quiescence has been bridged and the third phase or the sequelae of rheumatic fever have developed. Mitral stenosis, shortening of the chordae tendinae, dilatation of the left auricle with a mural thrombus climbing up its wall approximating the mitral valve, signs of decompensation, etc. are significant to the pathologist at the autopsy table in formulating the pathogenesis of rheumatic fever. In consequence, it appears to be a goal to be reached experimentally.

SUMMARY

Before the etiological factors essential to the pathogenesis of the heart lesions of rheumatic fever or treatment of the disease can be accomplished, an experimental model must be produced. A sampling of the significant attempts to reproduce the lesions of rheumatic heart disease experimentally has been reviewed. An effort to evaluate results of experimental work on the basis of what has been observed clinically and at the autopsy table has been made. A summary of this work follows:

1. Lancefield Group A streptococcus has been conclusively implicated as the initial factor in a sequence of events leading to rheumatic fever.

2. The necessity of multiple injections of Group A streptococcus before characteristic heart lesions can be produced is suggestive that the basic mechanism of the disease is related either to a hypersensitive or an antigen-antibody reaction.

3. The factor of biological variation enters into the picture plus the changes in the life cycle of the Aschoff body. These must be considered before success or failure of an experiment is asserted.

4. On the basis of experimental observation and postmortem pathological observation, leukocyte-platelet thrombi in coronary vessels and areas in close approximation to Aschoff bodies are similar to the verrucae seen on the mitral and aortic valves.

5. Experimental work has covered only the primary stage of the disease. Lesions of mitral stenosis and the sequelae of rheumatic fever have not been produced experimentally.

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PRESIDENT'S PAGE

DEAR DOCTOR:

It is a strange anxiety you feel when you become president.

The responsibility weighs more heavily than you believed it would.

Problems seem larger and more formidable when you stand before them.

You are determined to uphold the high tradition of medicine, and realize, for the first time in your life, that a president simply cannot do this without help.

And you say you will ask for the cooperation of every member, and every auxiliary member, to accomplish the goals you have in mind:

Like the goal of achieving a better public understanding of what medicine has to offer, and what medicine stands for.

Like the goal of revising antiquated laws, so medicine may better serve the public.

Like the goal of improving patient care.

Then the thought strikes you that these have been the objectives of every president before you. They also asked for help, but you were sure they meant someone else.

Why didn't this occur to you years ago? Had you assumed more responsibility in the past as a physician and as a citizen, some of your present problems might have been solved.

So you experience a strange anxiety as you become president, and you wonder about your friends. Do they know how you feel, and how urgent these problems are? Will they help? I hope so.

Fraternally yours,

A handwritten signature in cursive script that reads "Clyde W. Miller M.D.".

CLYDE W. MILLER, M.D.

EDITORIAL COMMENT

The Free Public School

Editor's Note. Although prepared as an address and not an editorial, the following paragraphs by Dr. Richard Greer, a member of our Editorial Board, seem destined for a wider audience than that which heard his talk, delivered at the dedication of the A. J. Stout Elementary School in Topeka on January 19. Dr. Greer's thoughts are reproduced here without his knowledge or consent.

In dedicating this school tonight to the memory of A. J. Stout, we do more than honor a man, we reaffirm an ideal. When we opened the doors of this building we opened them to all children regardless of their heritage, social position, or ability. This is the American Ideal—the Free Public School—a concept not known before this nation was founded, and even now seldom realized elsewhere. This ideal has led to troubles; the tax burden is great, school systems become large and unwieldy, teachers are scarce, and the results, to some critics, seem poor indeed.

I think that the record deserves some support. The specious arguments about teaching methods with the same turgid emotional reasoning are making headlines. Although we adhere to the philosophy that all children will be taught equally, we cannot guarantee that they will learn equally well. However, if we look at the staggering technical and scientific achievements of the past fifty years, we are struck with the fact that somebody learned something, somewhere. I admit, though only grudgingly, that we may lag in the humanities, and I am afraid that often we do not have time to dream, and if our dreams do reach for the stars they are likely to take the form of a skyscraper, a bridge, or a drill rig. I submit to you, that of course Johnny can read! But, I also insist that we need to devote our energies to content—to make wisdom our goal—that all our knowledge be applied to human good.

I think that it is nice to remember that this dedication is being made in memory of a dedicated man—a man dedicated to the American Dream—the Free Public School!

Medical History

Two significant projects designed to assemble and preserve the history of pioneer medicine in Kansas are now in operation. Both need the cooperation of individual Kansas physicians.

The Department of History at the University of Kansas is performing exhaustive research through

newspaper archives in the preparation of a book entitled *A Century of Medicine in Kansas*. In addition, the Kansas Medical Society is making available out of its files the minutes of all meetings from the date of its founding in 1859 to the present.

There are many, quite possibly the finest, historical anecdotes lying dormant in the memory of descendants of pioneer physicians which no research can uncover without the cooperation of those who know these stories. Events of significance of even 50 years ago are being lost for lack of an effort made to preserve them. Such things as early day epidemics, pioneer surgery, unusual personal experiences, education, travel difficulties, fees, collections, and a thousand other subjects are priceless items in the story of Kansas medicine.

It is hoped that each physician who can recall a story or many events out of medicine's past will contribute them to this Society project and that this will be done soon so the book can be completed by 1959 in time for the centennial celebration. A finished literary effort is not required. The contribution may be a single anecdote, a letter, or a biography. Anything will be appreciated to make this story a complete and an authoritative one.

The second project relating to the history of medicine in Kansas in which the profession is urged to help relates to the Kansas Historical Museum at Topeka. The director is currently constructing a pioneer town with rooms depicting a general store, a home, etc. One such will be a physician's office. This will exhibit authentic medical material, including anything a pioneer physician might have had in his office.

This permanent exhibition is currently being assembled, and a number of rare surgical instruments, saddlebags, and an old examining table have already been contributed. It is hoped that many more items may be made available to give this display the prominence it deserves.

Should any physician be willing to assist with either project, he is urged to write W. M. Mills, M.D., chairman of the Committee on History, Kansas Medical Society, 315 West Fourth Street, Topeka, and describe what he has available so the committee can determine how it might be used. Any cooperation given to either of these projects will be of real service to the Society and much appreciated by the committee.

Opposition to HR 7225

Thousands of words of testimony have been spoken before the Senate Finance Committee in its hearings on HR 7225, the Social Security Amendments Bill passed by the House of Representatives last summer and now under consideration in the Senate.

Many persons from all walks of life have expressed opinions on lowering the retirement age for women from 65 to 62, extending monthly benefits for disabled children beyond the age of 18, extending coverage to self-employed groups, and raising social security taxes. And the most controversial section of the bill, which would make permanently and totally disabled persons eligible to receive benefits at age 50 instead of 65, has been argued at length.

Physicians have been especially critical of this provision, arguing that permanent and total disability is difficult if not impossible to establish, that enactment of this amendment would encourage malingering, that it would be a step toward a program of compulsory federal medical care.

Opposition to the amendment was also expressed, for an entirely different reason, by Mr. Henry Viscardi, president of a manufacturing company known as Abilities, Incorporated, of New York. He believes such consideration for disabled persons is unnecessary, and he should know for he himself was born without limbs.

"I have spent my life close to this problem of disability," he told the committee, "and I have a great faith in solutions which can be obtained in a competitive, free enterprise spirit.

"I was born a crippled child, horribly deformed, with no lower limbs, and I spent the first seven years of my life, consecutive years, in one hospital. . . .

"When I was a child, I remember asking my mother, 'Why me?'

"And she told me that when it was time for another crippled boy to be born into the world, the Lord and his counselors held a meeting to decide where he should be sent, and the Lord said, 'I think that the Viscardis would be a good family for a crippled boy.'"

Possibly a background which includes that type of philosophy gave Mr. Viscardi the impetus he needed to found his company three years ago on an \$8,000 loan. In the first year of business the company grew to 59 employees—all disabled persons who could not get work elsewhere. The borrowed capital was repaid, with interest, during the first year, and a profit was realized. During the second year the company grossed more than \$400,000 in sales, and during the third year gross sales were in excess of \$600,000. The firm produces lace cable assemblies that are a component of the firing mechanism of sabre jets.

Mr. Viscardi now has 169 employees. This fact was of special significance to the Senate committee when he added that every one of this self-supporting group "could qualify for permanent disability under the terms of this law."

These "totally and permanently" disabled persons made a striking contribution to the economy of their community and their country: they produced goods

valued at \$1,248,700; they received salaries of \$668,500; they paid \$22,650 in social security taxes, \$6,200 in withholding taxes, and \$4,830 in disability payments to the state, and they returned \$2,067,790 in new wealth to their community. During these three years it would have cost the government \$415,850 to have supported these people on relief rolls.

"Their disability is because of prejudice and aversion and ignorance on the part of the industrial and commercial community," Mr. Viscardi testified. "What troubles me is that, should we stigmatize our disabled people and put on an age limit of 50, we might destroy the opportunity for them to be productive, and we might condone some of the ignorance and some of the prejudice that exist which prevent them from exercising their abilities and not their disabilities. . . .

"If we could only, in communities of America and in commerce and industry, shake the ancient superstitions which make us divide our world into able and disabled persons, and the prevailing belief that the man who has lost his limbs is different from other people. From a medical point of view, sure, he is different; but in society and industry it is his abilities that count and not his disabilities. . . .

"The extremes of physical suffering carry a great complement, which is the patience to continue to struggle for the right to be considered the same as the rest of the world, and not different.

"There is nothing that can be substituted for this basic human right. No honors, no pensions, no parades, no subsidy, can replace the wishes of every person who has known disability to live and work in dignity, in free and open competition with all the world, not as a different person, but rather as the same as others, with varying degrees of weakness and strength and complementary qualities to offset the extremes of physical make-up."

In summing up his opposition to the disability benefits, he added, "I have the belief in other solutions to the problem if we can only try them."

A.M.A. Meeting Next Month

The 105th annual meeting of the American Medical Association will be held in Chicago, June 11-15. Section meeting rooms will be located in University of Illinois facilities, Northwestern University buildings, and nearby hotels. The headquarters hotel will be the Palmer House, and exhibits will be housed at Navy Pier.

The National Medical Civil Defense Conference, sponsored annually by the Council on National Defense, will be held at the Palmer House immediately preceding the A.M.A. meeting, on June 9.



"The great work in which we are engaged demands all our time and all our energies. Let us see to it that we do not allow ourselves to be diverted from the real objects of our pursuit to waste our time and energies in combatting senseless theories, which, left alone, will soonest reach the oblivion to which they are inevitably destined. Let us remember that the aim of the true physician is not the accumulation of wealth, or personal fame or aggrandizement, but the advancement of his science, the perfection of his art, and the emancipation of mankind from the bondage of disease; that he alone is the sole conservator of the public health, and that he alone is charged with the responsible and elevating duty of rescuing his race from the disease and death incurred by their own ignorance and recklessness. This duty and this responsibility is ours.

"We cannot go forth into life without taking upon ourselves all of life's duties and responsibilities. We may ignore or disregard them, but they rest upon us nevertheless, and we shall justly be called to render account for the manner in which we have improved the talents and op-

portunities which have been intrusted to us. No man can safely allow himself in any pursuit to be governed by self-interest alone.

"If we would not dwarf and cripple the highest and noblest elements of our being, we must seek to be governed by higher and nobler incentives. And what higher incentive to action than the consciousness that its object and its tendency are to prolong human life and rescue it from the thralldom of disease and suffering; to increase its pleasures and diminish its pains; to stay in its course the death-scattering pestilence, and to cause that health and joyousness and thanksgiving shall prevail where otherwise would be death, disease and misery. Can we ask or seek a higher field or nobler work than this?

"Let us study to obtain higher and clearer views of the noble aims of our profession, that we may thereby be led to a more perfect consecration of all our energies to the great and ennobling work in which we are engaged."—*Albert Newman, M.D., President, Kansas Medical Society, 1868.*

Clinicopathological Conference

Severe, Progressive Constipation of the Newborn

CASE PRESENTATION

The case for our consideration today is that of a one-month-old white male who was admitted to KUMC on May 17, 1955, and expired on June 25, 1955.

The parents brought the child in with the comment that he "slept all the time." He had seemed to be normal until five days prior to admission, at which time the parents noticed that he was eating poorly and becoming lethargic. These symptoms became progressively worse during the next five days. His intake of fluid was down to two or three ounces daily, and there was marked oliguria. On the day before admission the child had some seizures characterized by jerking of the head, flexing of the arms, and clenching of the hands. His temperature was 101 degrees. Two small transfusions of blood were given into the gluteal muscles, and subcutaneous fluids were administered at a local hospital prior to his being sent here.

On closer questioning the parents admitted that the infant had been extremely constipated since birth and had been given frequent enemas to produce evacuation of his bowels.

At birth the child had weighed 9 pounds 14 ounces. The remainder of the past medical history is non-contributory.

On admission the patient was a poorly nourished, poorly developed white male who weighed 3925 grams, and who appeared to be acutely and chronically ill. His skin showed extreme pallor, and hematomas were noted in both buttocks. There was a grade II systolic murmur heard over the entire precordium. The abdomen was protuberant and tympanitic, and no bowel sounds were heard. The liver was palpable 5 cm. below the right costal margin.

Numerous pus cells were present in the urine, and there were occasional pus casts. There was no albumin, blood, or sugar in the urine, and urine cultures were all negative. The red cell count was 1,850,000 with 6.1 gm. hemoglobin; the white cell count was 37,400 with 37 per cent polys (29 per cent non-filamented), 6 per cent myelocytes, 8 per cent lymphocytes, and 10 per cent metamyelocytes. There were 83 nucleated red blood cells per 100 white blood

cells. The reticulocyte count was 18.8 per cent. The serum non-protein nitrogen was 33 mg. per cent, and the creatinine was 1.3 mg. per cent. The serum electrolytes were: sodium 129 milliequivalents per liter, potassium 5.4 mEq. and chlorides 98 mEq. The red blood cell fragility and Coombs tests were negative. Stool cultures were negative for pathogenic bacteria, but a blood culture on the day of admission was positive for *Micrococcus pyogenes* var. *aureus*. On May 24 a blood culture was positive for *Escherichia coli*. Subsequent blood cultures were negative.

The child underwent surgery on May 18; a greatly distended bladder and peritonitis were found. A cystotomy tube was inserted, and the abdomen was closed. Following surgery the child did poorly for many days, having severe abdominal distention which seemed to be aggravated by oral feeding. Consequently he could not take adequate food by mouth and had to be given intravenous blood, plasma, glucose, and electrolyte solutions. For the first 11 days he received blood almost daily. On May 27 he developed a wound infection at the site of the laparotomy. He had frequent, small, greenish-brown stools almost every day.

For a while the infant gradually seemed to improve and began to take his feedings a little better than previously. His abdominal distention was partially relieved by saline enemas and by colon tube, and he was no longer as lethargic as he had been on admission, albeit he remained somewhat weak.

On several occasions he voided through the penis, and the urinary stream was considered to be adequate. A cystoscopy was done on June 21 and findings were normal, so the cystotomy tube was removed. Subsequent to this he developed a urinary tract infection which yielded a heavy growth of *Bacillus proteus*. He vomited occasionally while in the hospital, but this was not really a prominent symptom until the last few hours of his life.

During the postoperative period he received several antibiotics, including penicillin, streptomycin, intravenous erythromycin, and intramuscular and oral chloramphenicol. The leukocyte count remained between 20,000 and 30,000 with 10 to 20 per cent of the leukocytes being non-filamented polymorphonuclears. During the last four or five days of life his temperature ranged between 102-103 degrees rectally. Prior to this he had been essentially afebrile.

On June 25 the baby was noted to have extreme abdominal distention, labored respiration, and cyano-

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

sis. It was decided to do a colostomy, but he expired before the procedure could be started. Postmortem electrolytes were normal, but the non-protein nitrogen was 61 mg. per cent.

Dr. Delp (moderator): Dr. Stockdale has tried to anticipate many questions that needed to be asked. Are there any other questions?

R. Leroy Carpenter (fourth year medical student): What about the nature of the bowel movements during the last five days?

Dr. Earl Stockdale (resident pediatrician): They did not change much. He had several small, watery, green bowel movements. Occasionally when the colon tube was inserted he had explosive, large, bowel movements. Rectal examinations were done at frequent intervals, and at no time was a fecal impaction found.

Jay Armstrong (fourth year medical student): Was a blood culture done during the last five days of life?

Dr. Stockdale: No.

Dr. Sloan Wilson (hematologist): Did the blood picture change after the initial count?

Dr. Stockdale: The child was transfused and his hemoglobin went up nicely.

Dr. Wilson: What happened to the reticulocytes and the nucleated red cells?

Dr. Stockdale: On admission there were 83 nucleated red cells per 100 white cells; two weeks later there was only one.

Dr. Wilson: Was a reticulocyte count taken other than the first one?

Dr. Stockdale: No, sir.

Dr. Delp: The white count varied from 37,000 on admission to 56,000 on June 15, which was ten days before death. Then the count gradually dropped to 15,000 on June 24, one day before death.

Nelson Bachus (fourth year medical student): Would you describe the heart murmur, and did it improve upon the administration of blood?

Dr. Delp: It was described as a grade I murmur by one observer and a grade II systolic murmur at the apex by another. Nothing particularly was made of this murmur.

Dr. Antoni Diehl (pediatric cardiologist): Was the fluid in the abdomen cultured at the time of surgery?

Dr. Stockdale: No culture was done at that time.

Dr. Delp: What was done at this procedure?

Dr. Stockdale: A laparotomy was done, and the peritonitis was found. There were adhesions present in the peritoneal cavity, and the bladder was enlarged. Because of this a cystotomy was done.

Dr. Delp: May we see the x-rays?

Willard Brown (fourth year medical student): A flat plate of the abdomen taken on the sixth hospital day shows normal bony structures and a diffuse hazi-

ness throughout the abdomen. Considerable gas is present which appears to be in a dilated colon. There is no gas present in the rectal ampula.

The film of a barium enema taken on the seventh hospital day shows the rectum to be of normal caliber; the sigmoid and descending colon are enlarged, and the haustral markings are poor (Figure 1). Again we note a diffuse haziness throughout the abdomen. The lateral view (Figure 2) taken at the same time demonstrates a fusiform swelling which becomes quite marked in the sigmoid area.

On a flat film of the abdomen taken the day of death the liver does not appear enlarged, but there is diffuse haziness throughout the abdomen and marked distention of the colon and intestines with gas. The abdomen appears distended. Again no gas is present in the rectal ampula.

In the chest film the lung fields appear clear, and there is no inflammatory process apparent. The heart is normal in size and configuration for a patient of this age.

Dr. Delp: Dr. Youngstrom, do you have any comment concerning these films?

Dr. Karl Youngstrom (radiologist): No, I think that they have been well described. I might add that the fluoroscopy showed inertia in emptying the bowel.

Dr. Delp: Mr. Carpenter, we want your summary and differential diagnosis.

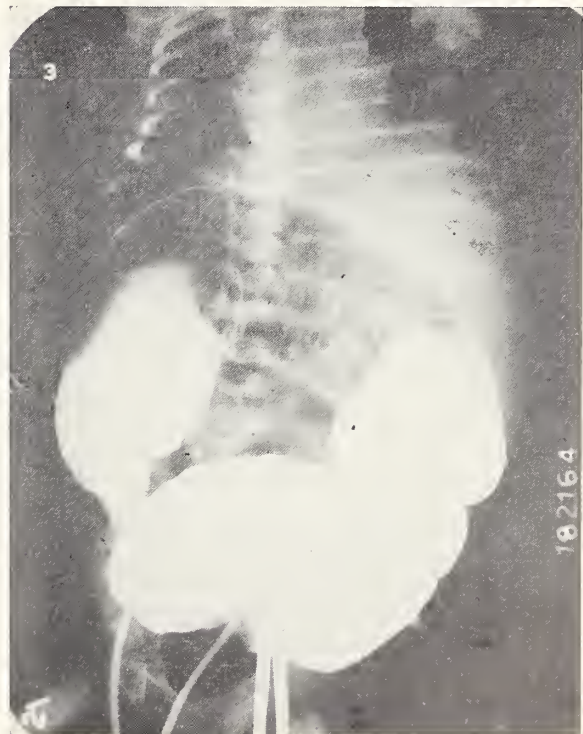


Figure 1

DIFFERENTIAL DIAGNOSIS

Leroy Carpenter (fourth year medical student): The patient for consideration today was a one-month old male who had had constipation requiring frequent enemas since birth. Otherwise he was apparently well until five days before admission, when he began to take feedings poorly, became lethargic, oliguric, febrile, and had generalized seizures. He entered KUMC acutely and chronically ill, weighing one pound less than his birth weight. His abdomen was protuberant and tympanitic. There was absence of bowel sounds and a faint heart murmur. Laboratory studies revealed pyuria, severe anemia, reticulocytosis and a positive blood culture for hemolytic staphylococci.

A laparotomy was performed on the day after admission. The protocol mentions that distention of the bladder and peritonitis were found, and that a cystotomy tube was inserted. The patient received blood, fluid, and intensive antibiotic therapy following surgery. He did poorly for a few days, then began to improve. He voided well, and cystoscopy was normal. Five days before death he again developed a temperature of 102 to 103 degrees, marked abdominal distention, and labored respirations. He expired prior to a planned colostomy five weeks after admission.

I shall base my differential diagnosis on the causes of chronic progressive constipation of the newborn. Occasional causes of constipation of this type are spi-

nal cord lesions such as cord injuries, meningomyeloceles, and spinal cord tumors. I rule these out because of the lack of any history of spinal cord injury and the lack of x-ray or physical findings.

This leaves us with the consideration of megacolon. Functional megacolon never occurs in this age group. Organic megacolon caused by lesions occurring in the lower colon and rectum, such as hemangiomas, primary sarcomas, carcinomas, polyps, congenital bands and valves, or anal sphincter abnormalities can be ruled out on the basis of the rectal examinations and x-ray findings.

The third type of megacolon is that called Hirschsprung's disease or aganglionic megacolon. It occurs in one out of every 20,000 to 30,000 live births and is ten times more frequent in males than in females. The outstanding features of this disease are progressive constipation starting at birth, anorexia, weight loss, anemia, bladder distention, and occasionally megaloureter. Ninety per cent of such cases have narrowing of the recto-sigmoid junction. Temporary relief is given these children by enemas, but this is never permanent. I believe that this patient had typical Hirschsprung's disease. He had chronic progressive constipation since birth. The fecal retention may have resulted in pressure necrosis and perhaps perforation of the intestine with resulting peritonitis and septicemia. The terminal event, I feel, was a combination of acute colitis, recurrence of the peritonitis, and septicemia which led to his death.

CLINICAL DISCUSSION

Dr. Delp: Mr. Bachus, why was this patient lethargic? Apparently he was lethargic from the day he got home from the hospital, about the sixth or seventh day of life, and had to be awakened for his feedings. Lethargy was prominent when the child arrived here.

Mr. Bachus: I thought originally that his lethargy was due to his septicemia, and was increased by his anemia and dehydration. But if he was lethargic from the time he came home from the hospital that would not explain it. I have no other explanation.

Dr. Delp: If his lethargy had started ten days before he came in, it could be explained by his sepsis?

Mr. Bachus: Yes, sir.

Dr. Delp: Mr. Belzer, what do you think about the problem?

David Belzer (fourth year medical student): I agree with Mr. Bachus. It might be caused by the septicemia that this child had, and aggravated by the dehydration on the basis of decreased intake of fluid.

Dr. Delp: Mr. Bare?

Chester Bare (fourth year medical student): I agree with what has been said, but the anemia could cause it also.



Figure 2

Dr. Delp: Mr. Carpenter?

Mr. Carpenter: He had oliguria and I would add, along with the other causes, the possibility of retention of nitrogenous wastes.

Dr. Delp: His nonprotein nitrogen was 33 when he came in. Mr. Brown, can you think of something else that might make the patient lethargic?

Mr. Brown: It could be his CO_2 .

Dr. Delp: His first CO_2 was 24.4 mEq; the next one was down to 23.2, and the one done on the 25th was 7.2. Anything else, Mr. Armstrong?

Jay Armstrong: I was thinking about potassium, but it is normal here.

Dr. Delp: Well, he had several potassium determinations; the first one was 5.4 mEq/L and the next one was 4.9. The last blood specimen was hemolyzed. Mr. Alcox, why did this patient have seizures?

Leroy Alcox (fourth year medical student): Seizures are frequent in young children with high fevers.

Dr. Delp: Are you perfectly satisfied with that explanation? Can't you be a bit more exact?

Mr. Alcox: On the basis of the laboratory findings there is nothing to explain it.

Dr. Delp: Mr. Bachus?

Mr. Bachus: I thought this was a febrile convulsion.

Dr. Delp: Well, of course we don't know whether he had fever with the first one, but he apparently had fever when he first got to the hospital. Mr. Alcox, how can we explain the fact that this patient had peritonitis?

Mr. Alcox: Peritonitis is frequent in children with Hirschsprung's disease. Enemas or other attempts to lavage the intestines easily perforate it.

Dr. Delp: Do you have any other ideas, Mr. Bachus?

Mr. Bachus: I don't think the patient perforated. I think that the bacteria were transmitted through the bowel secondary to dilatation.

Dr. Delp: By osmosis?

Mr. Bachus: Well, perhaps a pressure necrosis would let them through the wall.

Dr. Delp: I see, and the wall became more permeable under those circumstances. Mr. Belzer, do you accept that?

Mr. Belzer: Well, it is a possibility, but I also think the septicemia could explain it.

Dr. Delp: What was the origin of the septicemia?

Mr. Carpenter: I think this lad had colitis. He had an infection in his bowel, and the bacteria got into the peritoneum that way. He had large fecal masses, distention, and irritation of the bowels with colitis and ulcerations.

Dr. Delp: Mr. Bare, what do you think that antibiotics had to do with this patient's signs and symptoms?

Mr. Bare: They undoubtedly account for the negative blood and urine cultures that were found during his hospitalization.

Dr. Delp: Anything else?

Mr. Bare: The chloramphenicol could account for some of the shift to the left in the blood count.

Dr. Delp: Mr. Brown, what do you think?

Mr. Brown: There are several cases reported in which antibiotics were the cause of the colitis.

Dr. Delp: Mr. Carpenter?

Mr. Carpenter: Antibiotic colitis is a strong possibility with change in flora to resistant forms.

Dr. Delp: Do you want to change your diagnosis now?

Mr. Carpenter: I will stick to Hirschsprung's disease with a secondary colitis.

Dr. Delp: Mr. Alcox, why did this child have a distended bladder?

Mr. Alcox: In 50 per cent of all cases of Hirschsprung's disease, there is an associated dilatation of the bladder.

Dr. Delp: You heard that there was a cystoscopic examination here and that the lower urinary tract was normal. What about the distended bladder, Mr. Bachus?

Mr. Bachus: I was accounting for it in much the same way. Certainly he didn't have any lower urinary tract pathology to produce the distended bladder, and one might think of a primary bladder hypotonia.

Dr. Delp: Mr. Carpenter?

Mr. Carpenter: I was going to postulate that the peritonitis caused this bladder distention.

Dr. Delp: Mr. Armstrong, why was this patient dyspneic?

Mr. Armstrong: Probably on the basis of the abdominal distention to start with. The lung fields look pretty good.

Dr. Delp: Mr. Brown, what caused the dyspnea?

Mr. Brown: Didn't you say that his CO_2 was 7?

Dr. Delp: I did!

Mr. Brown: Probably acidosis.

Dr. Delp: Mr. Bachus?

Mr. Bachus: His anemia could also be another factor.

Dr. Delp: When he was extremely dyspneic his hemoglobin was 50 per cent. Was he dyspneic all the time, Dr. Stockdale, or just the last two or three days?

Dr. Stockdale: Severe dyspnea was present only in the last few days.

Dr. Delp: Have you any other ideas, Mr. Bare?

Mr. Bare: I don't have any.

Dr. Delp: Dr. Miller, I would like to have your comments concerning this patient.

Dr. Herbert Miller (pediatrician): I would like to



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¹January, H. L. et al: Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.



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ask what kind of enemas were given to the baby at home?

Dr. Delp: We don't know.

Dr. Miller: If these were tap water enemas, this could possibly account for the low sodium that this baby had. He did have an acidosis according to studies that were done on admission, with the base totaling up to 134 milliequivalents and the total anions in the neighborhood of 144 milliequivalents. This would suggest that the baby had some respiratory acidosis when he came in. He was distended and perhaps did have some trouble blowing off carbon dioxide as a result of the marked abdominal distention. The low sodium might have been accounted for by repeated enemas which would tend to draw sodium out of the body if tap water were used.

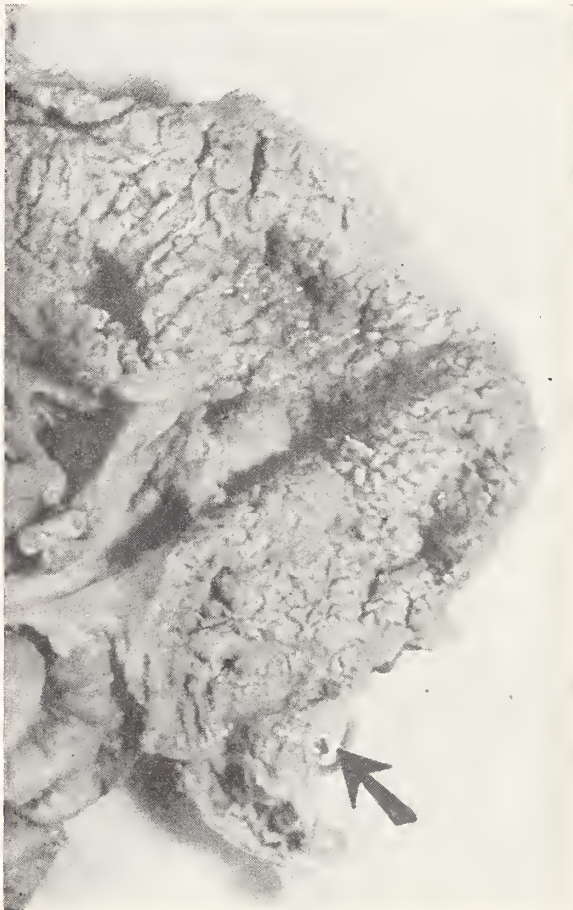


Figure 3. A shaggy pseudomembrane covers the mucosa of the hypertrophied and dilated descending and sigmoid colon. Arrow indicates the beginning of the rectum where the lumen begins to narrow to normal caliber and the pseudomembrane disappears. A small band of anal skin is included on the lower end of the specimen (reduced $\frac{1}{4}$).

Dr. Delp: On the second day, Dr. Miller, the sodium was 126 and the chloride was 94.

Dr. Miller: I would think that these are probably correct. In my opinion the baby's sleeping all the time was related to the infection. What caused the convulsions I do not know, unless they resulted from fever. It is easy for babies to have convulsions when they have considerable fever. I cannot explain why this is so.

I have no reasons to disagree with Mr. Carpenter with regard to what was going on in this baby. I think that he is very likely right.

Dr. Delp: Dr. Allbritten, do you have any comments about this diagnosis? Do you disagree with Mr. Carpenter?

Dr. Frank Allbritten (surgery): No, I agree with the diagnosis. I think that it was not clear at the time of exploration as to the extent of the baby's adhesions and peritonitis. I assume it was generalized peritonitis. There was no comment about the colon's having been identified at the time of operation, and it is conceivable that there was a mass of adhesions and fibrinous material so that one could not delineate the small and large bowel, although the bladder could be seen as an anatomical structure.

Dr. Delp: One of the medical students drew a picture in this chart indicating a ridge-like mass that extended from the upper left quadrant to about the middle of the right flank. Do you think this would mean anything so far as the physical findings are concerned?

Dr. Allbritten: Yes, it would be suggestive of a tremendously distended transverse colon.

Dr. Delp: Now may we have the pathologist's report?

PATHOLOGY REPORT

Dr. Harlan Firminger (pathologist): At the time of autopsy this child was about normal in height, measuring 23 inches. He was distinctly undernourished, weighing only 4300 grams, and his abdomen was greatly distended. There was a healed scar over the lower abdomen and a healing cystotomy wound. When the abdomen was opened the bowel loops were clearly adherent, and everything was bound together in a mass by fibrinous adhesions. In addition there was an abscess 4 cm. in diameter in the pelvic region.

The major item of interest was the colon. It was a tremendously dilated structure occupying much of the abdomen. It had thick walls and was distinctly hypertrophied as well as dilated. The lumen of the colon narrowed gradually just above the rectum to about normal caliber (Figure 3).

The mucosa of the colon was covered with a white pseudomembrane which, when scraped off, revealed a rather granular underlying surface. The pseudo-

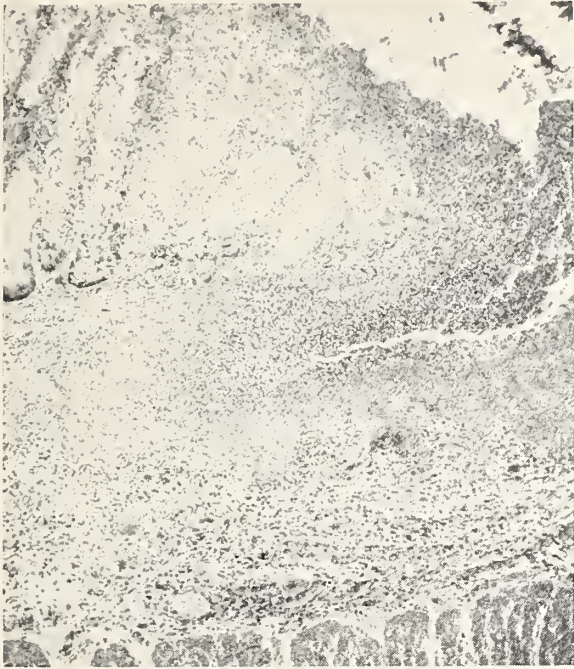


Figure 4. Pseudomembranous colitis with edge of an ulcer extending into the submucosa. There is necrosis particularly of the superficial mucosa which is covered by a fibrinopurulent membrane. At the right margin the marked inflammatory process extends through the mucosa into the submucosa. The underlying muscularis propria, incompletely shown, is much thickened (hematoxylin and eosin stain).

membrane covering the colonic mucosa disappeared in the rectum.

A microscopic section (Figure 4) shows the pseudomembranous covering of the colon with many polymorphonuclear leukocytes and inflammatory cells throughout all layers, some destruction in the upper layers of the mucosa, and considerable edema and inflammatory infiltration of the submucosa. In one area there is an ulceration of the colon; there were a number of such ulcerations. In three places we found actual perforations of the colon extending out into the adjacent peritoneal area.

The volume of the urinary bladder was only moderately increased, but the wall of the urinary bladder was three or four times normal thickness. A section of the wall of the bladder showed the thickening to be the result of hypertrophied muscularis and submucosa.

There were several lesions in the lungs. One was an organizing embolus in the pulmonary artery at the hilus of the left lung. We also found a cystic area of old infarction at the base of the right lung which was adherent to the diaphragm. There were scattered yellow areas which we interpreted as aspiration pneu-

monia; at the time of autopsy there was vomitus in the trachea and in the mouth.

The liver was slightly enlarged, weighing 300 grams. It contained only a small amount of fat. There were pigmented macrophages and Kupffer cells containing a golden brown hemosiderin pigment everywhere. This indicated hemosiderosis. There were also foci of hematopoiesis, and the bone marrow was hypoplastic.

There was a marked involution of the thymus. It weighed only 1.5 grams.

The heart was enlarged, weighing 38 grams, which is almost twice the normal weight for this age.

Regarding the Hirschsprung type of megacolon, there is ordinarily a constricted, aganglionic segment of bowel at the region of the rectosigmoid, and indeed that was the situation in this case (Figure 5, top). Above this level, in the hypertrophied portion of the megacolon, Auerbach's plexus is intact (Figure 5, bottom).

As has been suggested, this is sometimes associated with distention of the urinary bladder. Both the urinary bladder and the colon are supplied by the pelvic parasympathetic plexus, and it seems likely that deficiency of these nerves would involve the bladder as well as the colon. At times this has been found.³ In this case we have been unable to confirm this despite many sections. We could see nothing in the bladder and urethra to explain the distention, and we could

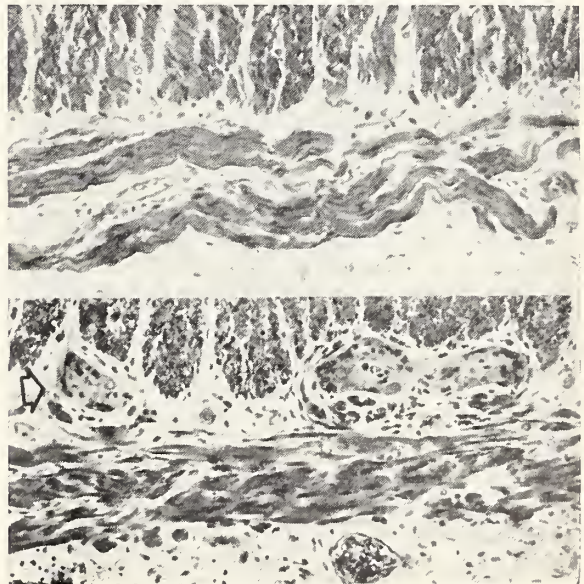


Figure 5. Note the absence of Auerbach's plexus in the aganglionic segment of the rectum (top) in contrast to the large ganglia, indicated by arrow, in a section from the hypertrophied and dilated colon (bottom) (hematoxylin and eosin stain).

not say that it was necessarily comparable to the change in the colon.

The pseudomembranous colitis is similar to the two cases which Moriarty and Ramsey¹ reported in babies with megacolon who had been given large doses of antibiotics. Presumably this was a matter of changing flora and stasis of the material in this area.

The enlarged heart is difficult to explain. Dr. Miller has already referred to the possibility that this baby was given tap water enemas at home. In addition to losing sodium, there may have been absorption of water which could produce hydremia. Another factor may have been the anemia, but this heart was hypertrophied out of all proportion to what is normal in a child of this age. With respect to the anemia, there was hyperplasia of the marrow with abundant red cell formation. Most of these children do have anemia, though I am not quite sure what the etiology is. I doubt that it is suppression of the marrow. The hemosiderosis is probably attributable to the transfusions which this child had received.

Dr. Delp: There have been allusions to the fact we now have for this syndrome an explanation which did not exist a few years ago. I am old enough to recall vividly and bitterly the number of such patients that I encountered when I was an intern and resident in which the outcome was invariably just as unsatisfactory as in this case.

I would like to clear up a few things in the time remaining by calling on Dr. Allbritten, Dr. Miller, and Dr. Valk.

Dr. Allbritten: There has been considerable change in the treatment of this disease in the past few years. Previously the treatment was directed toward the dilated segment of the colon, and surgical attempts were made to resect large areas of the dilated portion of the colon and do end to end anastomosis. To everyone's disappointment, the dilatation promptly recurred. The attempts were directed toward the obvious area rather than to the area of functional obstruction. In 1948 Whitehouse and Kernohan,⁵ and later Swenson with his coworkers,⁴ approached the disease from a different standpoint and started the direct surgical attack on the obstructed area. They resected the aganglionic segment of the bowel and anastomosed the colon to the anal area. This procedure has proved to be more satisfactory.

One thing that has been commented on, and which needs repetition, is that the area that is dilated was examined for abnormalities, but no abnormality was found. Regarding this patient's bladder, I wonder if we were not looking in the wrong area in the bladder, and should have been looking at the site of obstruction rather than at the site of dilatation.

Dr. Firminger: We did examine the urethra, and

ganglia were present down into the prostatic urethra at least.

Dr. Allbritten: Even through the membranous urethra and sphincter?

Dr. Firminger: Our microscopic sections include the sphincter and part of the prostatic urethra. The remainder of the urethra was grossly normal.

Dr. Delp: Dr. Valk, do you have any comments?

Dr. William Valk (urologist): When one encounters distention of the bladder and pus in the urine, the normal procedure is to pass a catheter into the bladder to relieve this distention. This type of bladder can obstruct the recto-sigmoid and cause severe dilatation of the colon. It can blot out the venous return in the pelvic veins and cause edema of the extremities. I am sure that this child had primary Hirschsprung's disease, but I am also sure that he might have been greatly improved by simple passage of a catheter before surgery. This would have relieved his distention and distress a great deal. As has been said, urinary tract anomalies are associated with Hirschsprung's disease, but it is a little different from the bowel and gastrointestinal tract as far as innervation is concerned. One can totally denervate the ureters and the bladder without producing a picture similar to Hirschsprung's disease. A denervated ureter does not distend and become a greatly dilated structure as the colon does. I believe that it is probably a little different mechanism than aganglionic disease of the colon.

Dr. Delp: Dr. Miller?

Dr. Miller: The English have recently shown that, in ten babies who had Hirschsprung's disease, the colon is not large and dilated in the first two or three months of life. Might not the bladder have been enlarged because of peritonitis instead of Hirschsprung's disease?

Dr. Valk: At operation the bladder was a thin, friable, dilated structure. This is extremely unusual in the absence of organic or neurogenic obstruction of the bladder. Hypertrophy of the bladder indicates that oliguria must have been present at birth or even from the seventh month of intrauterine life when the fetus first starts to pass urine into the amniotic fluid.

Dr. Miller: You think the bladder was involved even though the ganglion cells appear in normal amount?

Dr. Valk: I don't know.

Dr. Delp: Any final comments or questions?

Dr. Youngstrom: Swenson and Fisher² have recently reported on dilated ureters associated with this condition, and they theorize that the lesion might be in the cord rather than in the bladder or urethra. So there seems to be room for further thought on the etiology of this condition.

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1. Paroxysmal Whirling Vertigo. *This consists of sudden attacks of dizziness, often when the patient is at rest or asleep. The patient may feel that he himself is whirling or that fixed objects about him are whirling. The attack usually lasts for a few minutes; occasionally it is severe for weeks or subacute for months.*



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2. Fluctuating subtotal hearing loss, usually affecting the higher tones, is noted at the same time as vertigo.
3. Tinnitus, usually unilateral, is associated with the deafness and dizziness.

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drome... will prevent or arrest attacks of vertigo. It will also reduce the intensity of the tinnitus and so may save some of the hearing in the affected ear."

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Dr. Delp: Hirschsprung's disease should occupy high priority in a differential diagnosis of progressive constipation in the newborn. Such a statement becomes even more reasonable today with newer knowledge concerning the true character of the malady and the gratifying results from prompt surgical treatment. Only a moment's thought will suggest, as in this case, the danger of salt depletion and water intoxication which may result from retained water enemata in such a patient. The recently recognized relationship of megacolon and megaloureters is given further legitimacy by this case.

PATHOLOGICAL ANATOMICAL DIAGNOSIS

Primary

Congenital megacolon with hypertrophy and dilatation of the sigmoid, transverse and ascending colon with multiple ulcers, advanced.

Multiple ulcers of the ileum and jejunum, slight (history of abdominal distention and constipation for six weeks before death).

Hypertrophy of the urinary bladder (history suggestive of megalo-bladder).

Healing midline incision of anterior abdominal wall; healing cystostomy wound and sinus tract (history of distention of the urinary bladder and pelvic peritonitis with performance of cystostomy).

Organized emboli in smaller branches of the pulmonary artery with old cystic infarct of the lower lobe of the right lung and overlying fibrous pleural adhesions.

Loculated small abscess in pelvis (history of incision and drainage of wound abscess four weeks before death).

Malnutrition, height 23 inches, weight 9½ pounds.

Diffuse pseudomembranous colitis with penetrating ulcers and local acute fibrinopurulent peritonitis (history of treatment with several antibiotics including aureomycin).

Diffuse serofibrinous peritonitis with focal areas of angulation of the small bowel and penetrating ulcer of the colon.

Fatty metamorphosis of the liver, 300 gms.

Involution of the thymus, 1.5 gms.

Hyperplasia of the bone marrow of the sternum and vertebrae.

Foci of extramedullary hematopoiesis in the liver and spleen, slight.

Hypertrophy of the heart, 38 gms.

Hemosiderosis of the liver and spleen, slight (history of anemia and repeated small blood transfusions).

Dilatation of acini of pancreas, slight (history of dehydration).

Recent puncture wounds and ecchymoses of both femoral regions and of the scalp and healing incisions over both medial malleoli (history of repeated venipunctures).

Gastric contents in the oropharynx and tracheobronchial tree.

Foci of aspiration pneumonia.

Partial atelectasis of the upper and lower lobes of both lungs.

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Pamphlet on Quacks

To help the public identify some of the devices, gadgets, and machines used for so-called "treatments" or "cures" of many diseases, the A.M.A.'s Bureau of Investigation has issued a new pamphlet on mechanical quackery. A check list for identification of quacks in the local community is included.

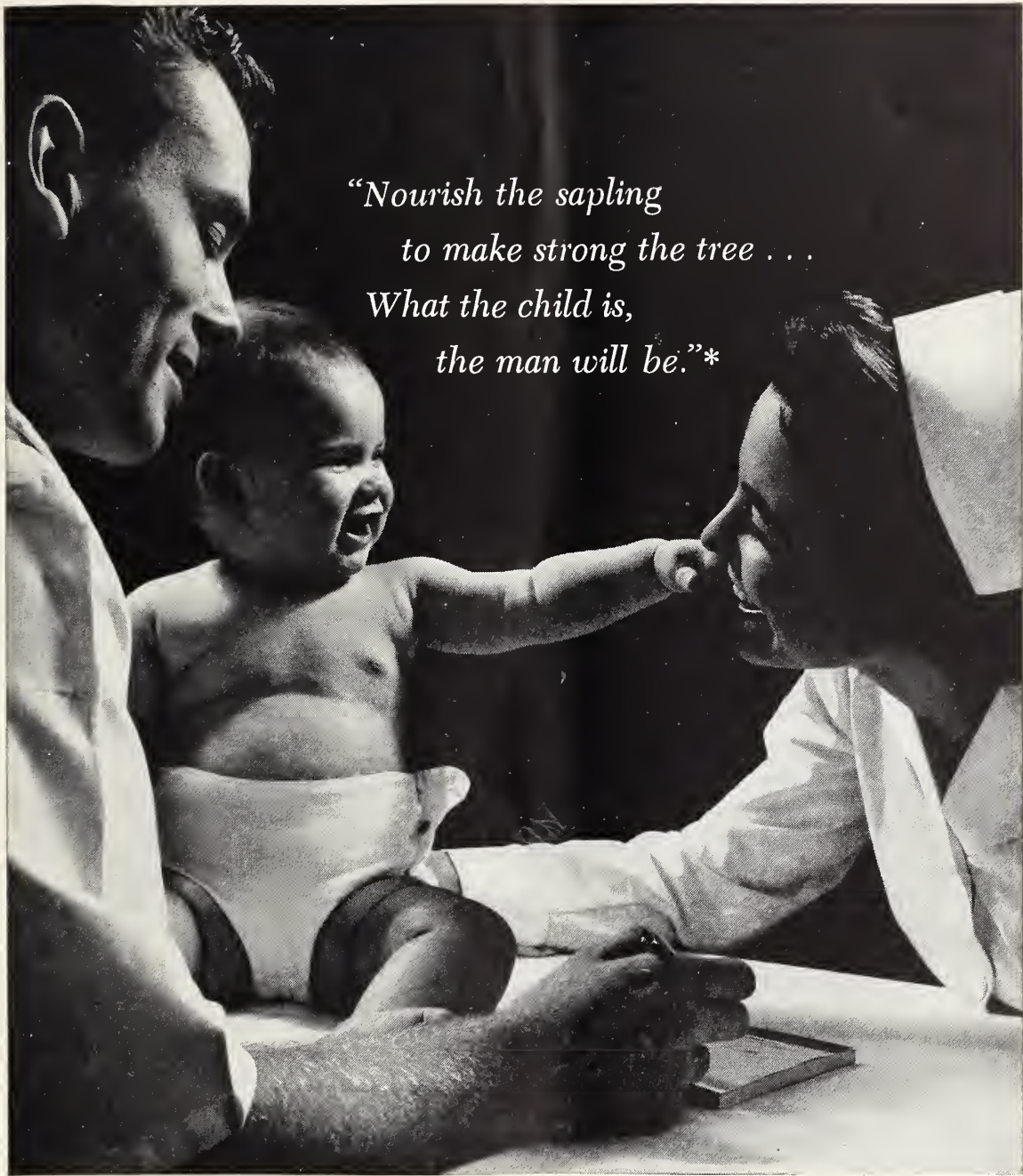
The pamphlet will be distributed primarily at A.M.A. exhibits on quackery at medical society meetings, health fairs, museums, etc. It will also be sent by mail to those who request copies from the bureau.

Information on Adoptions

Proceedings of a conference on adoption held last year by the Department of Health, Education, and Welfare are published in a report, "Protecting Children in America," recently released by the Children's Bureau. Attended by representatives of the medical, legal, and social professions, the conference explored ways to eliminate the "black market" in babies.

Copies of the pamphlet may be secured from the Children's Bureau, Washington 25, D.C.

The Series H Savings bond, issued only since mid-1952, will pass the three billion dollar mark in sales before it is four years old.



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What the child is,
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PHYSICIANS' ACTIVITIES

Dr. Jacob T. Whallon, Wichita, who recently took up art as a hobby, painted an oil picture which was chosen for exhibit at the third annual art show in Wichita recently.

Dr. R. Dale Dickson, Topeka, was a member of the faculty at a postgraduate course sponsored by the American College of Allergists in New York in April.

Dr. Eldon S. Rich, Buhler, has announced plans to close his office there to go to Newton on June 1 to join the staff of the Bethel Clinic. He will practice obstetrics and general medicine.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, is a member of a team of six physicians now conducting a series of meetings in Japan for medical schools and medical societies. The educational program is sponsored by Unitarian Service Committee, Inc., and will last for six weeks.

Dr. J. S. Menaker, Wichita, presented a paper, "Psychosomatic Gynecology," at a meeting of the American Academy of Obstetrics and Gynecology in Memphis in March.

Three Kansas City physicians, **Dr. A. J. Rettenmaier**, **Dr. C. J. Mullen**, and **Dr. W. J. Feehan**, have been named to an advisory and planning committee for Creighton University, Omaha.

Dr. Enos A. Nelson, Phillipsburg, was honored recently by the Masonic order in that city on the completion of 50 years of membership.

Dr. Alvin Y. Wells, Winfield, was speaker at a recent meeting of the Cowley County Medical Assistants' Society. He discussed serums and vaccines.

Dr. George M. Gray, Kansas City, who was honored recently on the occasion of his 100th birthday, was the subject of a number of feature stories, especially in Kansas City papers. In one photograph Dr. Gray was pictured while reading the JOURNAL OF THE KANSAS MEDICAL SOCIETY.

Dr. Robert M. Brian, El Dorado, spoke on "Radioactivity and Isotopes" at a recent meeting of the El Dorado Hospital Auxiliary.

Health officers for a number of counties were named recently by the respective boards of county commissioners. Those announced are: **Dr. L. G.**

DEATH NOTICES

ROBERT L. VON TREBRA, M.D.

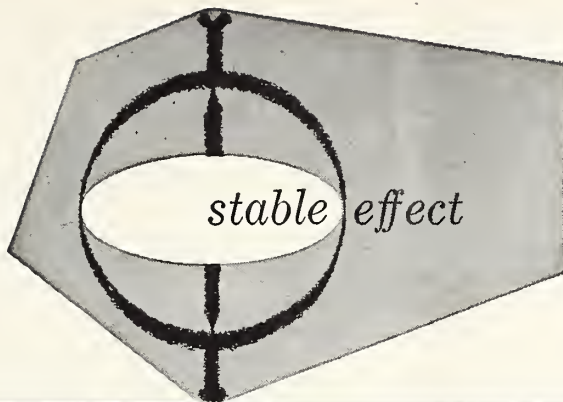
Dr. R. L. Von Trebra, 86, a retired Chetopa physician, died in a Parsons hospital on March 11 after having been a patient for several months. He was graduated from Keokuk Medical College in Iowa in 1897 and practiced there for a while, moving to Kansas in 1901. He was associated in practice with his sister, Dr. Ernestine Von Trebra. He was interested in Society activities, holding membership in the Labette County Medical Society, and also had a number of civic interests. He had served as a councilman and as mayor of Chetopa and had also been elected to the state legislature.

JOHN ARTHUR HIBBLER, JR., M.D.

Dr. J. A. Hibbler, Jr., 44, a member of the Wyandotte County Medical Society, died at Wheatley Provident Hospital, Kansas City, on March 12 after suffering a cerebral hemorrhage several days earlier. He was a graduate of Meharry Medical School, class of 1935, was a resident surgeon at General Hospital No. 2, Kansas City, Missouri, for three years, and went into private practice in 1939.

MAURICE S. WESSELL, M.D.

Dr. M. S. Wessell, 54, who formerly practiced in Hiawatha and had been in practice in Burlington since 1954, suffered a heart attack and died on March 25 while in Hot Springs, Arkansas. A graduate of Albany Medical College in 1927, Dr. Wessell was interested in military medicine and served as a flight surgeon from 1940 to 1947. From then until 1951 he was an associate professor of surgery at the University of Arkansas School of Medicine, Little Rock, and chief surgeon at the Veterans Administration Hospital there. He was a member of the Coffey County Medical Society.



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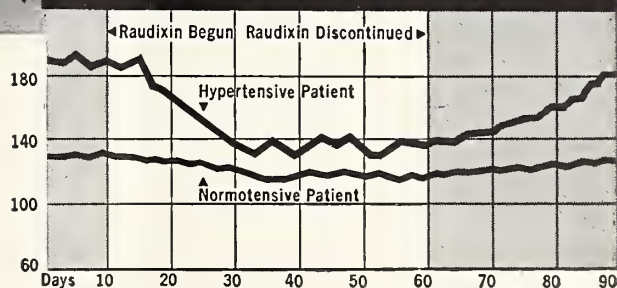
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Dr. Adelbert R. Chambers, Iola, has announced that he is a candidate for the Republican nomination to the office of Allen County representative in the state legislature.

Dr. Peter K. Wiens, who graduated from the University of Kansas School of Medicine last year and has completed internship at St. Luke's Hospital, Kansas City, Missouri, has begun practice in Minneola.

Dr. Clyde B. Trees, president of the Shawnee County Medical Society, has accepted appointment to the Topeka Board of Education's 20-member advisory committee.

Dr. George W. Davis, Ottawa, recently observed the 60th anniversary of his graduation from the University Medical College of Kansas City, Missouri.

Dr. Wayne O. Wallace, Atchison, was speaker at a dinner meeting for the public sponsored by the Atchison County Chapter of the American Heart Association. He also showed a film, "The Valiant Heart."

Dr. Charles S. Huffman, Columbus, was honored by the Masonic Lodge in his home community recently and was presented with a 50-year membership pin.

A feature story in the *Coldwater Western Star* recently paid tribute to **Dr. R. A. J. Shelley** who has been practicing since 1903, first at Waldron, then at Protection and Zenda, and in Coldwater for the past 32 years.

Dr. Val Converse, formerly of Kansas City, moved to Horton on March 1 and is now associated with the Horton Hospital and Clinic.

The Sharon Springs community announces that its

seven-year search for a physician ended recently when **Dr. A. R. Cuadrado**, who had been practicing in Colby, moved there to practice.

Dr. Melvin Masterson, who practiced in Richmond, Missouri, before entering service with the Air Force in 1954, was discharged recently as flight surgeon at the Air Force Base at Waco, Texas, and has opened an office in Louisburg.

The Sedgwick County Chapter of the American Academy of General Practice announces the election of the following officers: president-elect, **Dr. Bruce P. Meeker**; vice-president, **Dr. Jack G. Phipps**; secretary-treasurer, **Dr. Harry T. Hidaka**, and member of the board of directors, **Dr. Harold L. Low**.

Dr. William L. Valk, of the University of Kansas Medical Center, was one of the speakers at a meeting of the Urologic Society of Mexico at Mexico City last month.

The Samuel J. Crumbine medal, bestowed by the Kansas Public Health Association for outstanding service to public health, was awarded to **Dr. Ralph I. Canuteson**, Lawrence, last month.

Dr. Garland O. Wellman, on leave of absence from the Sedgwick County Society and now in Texas City, Texas, was elected to fellowship in the American College of Surgeons recently and also became a diplomate of the American Board of Surgery.

An invitation to participate in the President's Conference on Occupational Safety, to be held in Washington, D. C., May 14-16, has been accepted by **Dr. Leslie L. Saylor**, Topeka.

Dr. Lennert B. Mellott, who has served in the medical department of the Sunflower plant for several years, has announced plans to return to semi-private practice in Bonner Springs. He will continue to serve at the plant three mornings a week.

Dr. Karl Stock, Topeka, returned recently from Baltimore where he attended a meeting of Wilmer Eye Residents at Johns Hopkins University.

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Epilepsy

The History of Folklore in Its Treatment

THOMAS M. DOUGHERTY, M.D., *Kansas City, Missouri*

"If I wished to show a student the difficulties of getting at truth from clinical experience, I would give him the history of epilepsy to read."

Oliver Wendell Holmes

There are many wonderful new drugs coming out every month or so for the control of epilepsy. Each is greeted with great acclaim, then after a time it, too, takes its true place in the treatment of epilepsy. It is interesting that while each of these new drugs is heralded as being the one which will free the poor sufferers from their scourge, none of them, when viewed in their true perspective, seem to do so. A review of the history of the treatments of epilepsy and the drugs and treatments that in prior times were to have cured man of epilepsy would be interesting and would give added impetus to the words of Oliver Wendell Holmes.

In this paper treatment will be the main subject of discussion; theories as to etiology will be mentioned only insofar as they pertain to the rationale, if any, of the therapy in question.

Judging from early historic writings and pre-historic findings, the old saying should be changed to read, "Taxes, the poor, and epilepsy we have always with us." During the period of time from the neolithic to the present about everything animal, vegetable, or mineral has been used in the treatment of epilepsy. Depending upon the theory under which a patient was treated, material was poured into a patient or drained out; this not being possible, it was rubbed into or hung upon a patient. Incantations for and against the patient were used, and many a poor epileptic has lost parts of his anatomy in attempts at treatment. At one time or another, the conduct of the poor epileptic was controlled more rigidly than that of an eager virgin.

For a general outline of the subject of folklore history of epileptic treatment, five general categories seem possible: (1) the general way of life by which an epileptic must abide; (2) spiritual treatments, including devils and gods; (3) animal treatments, in-

cluding man and lower forms; (4) vegetable treatments, including all drugs grown on the earth; (5) mineral treatments, both in their pure and adulterated forms.

It must be understood that three basic principles were used in treatment, i.e., magic or superstition, rational explanation, and empiricism.¹ To differentiate between these is difficult; since this is not written at the time of the prescribers, no distinction can be made.

As a prerequisite to living without seizures an epileptic was told to stay away from swamps, rivers, or any moist area.² He was told to remain away from too much wind, sudden changes in temperature, or loud noises, for all these things would bring on the disease.³ He was to sleep, but not too soundly or during the day. Exercise, of course, was good, but only in moderation, taken just as prescribed and when scheduled.⁴ As Galen says, "Speaking generally, I recommend abstinence from daily or immoderate use of such food as engenders unhealthy humors or as causes constipation or flatulence, and is hard to digest."⁵ Galen is safe in such generalities. More specifics are listed later pertaining to foods.

These above prescriptions were good because epilepsy was said to be caused by various humors. If the brain were too humid, humors rising to the brain would make the brain too moist, or the heat would make the humor too thin, or cold would make the phlegm too thick. These were certain things that would cause bile to congeal in the brain. Exercise would keep the humors flowing.^{1, 4, 6, 7}

Some said that baths should be abhorred because of moisture,⁵ whereas others thought them beneficial for their purifying effects.⁸ Efforts at dehydrating the patient and at fasting were made; however, no explanation or reason other than spiritual or humoral was given until the 20th century.^{2, 8, 9, 10}

It is interesting to note that diet has had much attention throughout the ages. The Arabs anticipated the ketogenic diet for whatever reason, in that long ago they prescribed a diet of fat meats "to the point of disgust and nausea."⁶ During the middle ages much talk, but no progress, was made regarding diet. Gowers himself includes a discourse on the subject. It was not until the 1920's that the reason for a ketogenic diet was given.⁹

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Dougherty is now serving his internship at General Hospital, Kansas City, Missouri.

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The use of wine or alcohol in any form was controlled. There were those who advised small quantities;¹ however, none encouraged its use.^{3, 10, 11} This is one point upon which it seems that even the superstitious agree with the physicians of the day, who definitely concur with modern day therapy.⁹

Whether or not an epileptic should marry is a question that has been discussed for ages. Granted, views as to why one should or should not marry differ from learned discourses on eugenics to the individual effects of intercourse on the course of epilepsy, but each author has had strong feelings on the subject throughout the ages.^{1, 2, 10}

Gowers in 1885 states, "In the interest of the individual, of the family, and of the race, it is therefore desirable to discourage as far as possible the marriage of epileptics."¹⁰ Hector Boece, writing about 1550, indicates that the Scottish clans thought more strongly about the matter. He recommended that a male epileptic be "instantly gelded and a woman kept from all company with men and if she were found to be with child, she and her brood were buried alive."¹⁴

The sexual act itself was mentioned often, and it was said to be closely allied with epilepsy. Some said that coitus cured epilepsy,⁵ others said it caused epilepsy.^{8, 15} Temkin quotes the Hippocratic papers: "Coitus is a slight epileptic attack."⁴ Kanner quotes, "Coitus brevis epilepsia est."⁶

Castration was practiced. At some periods it would seem to have been used for the purposes of a cure,¹⁵ at others as a form of eugenic hygiene,¹⁰ and still again as a punishment.¹⁴ It is rather difficult to tell from the literature just which was the reason. Oophorectomy for a cure was advised as late as 1880. There is also "the strange unverified and not quite probable belief that Napoleon Bonaparte had an epileptic attack after each intercourse." Kanner tells of a certain Turk, Sultan Murad III, who owed his epilepsy to over indulgence in the harem.⁶

Pliny believed that intercourse was good for epilepsy.¹⁶ The fact that children who had seizures during childhood often ceased to have attacks after puberty, led to the conclusion that seizures disappeared after intercourse. Thus, early authors thought to hasten the cure by "doing malice to the nature of children by unseasonable coition."^{15, 16}

Continence with retained semen was thought to cause epilepsy.⁶ Retained menstrual blood was thought to be another cause.¹ Perhaps the worst idea of the cause of epilepsy was held by those who attributed it to masturbation.¹⁷ This belief continued to the time of Gowers¹⁰ and is held by some even to the present.¹⁸

Aside from the general views of the hereditary nature of epilepsy, the Talmud states that epileptic chil-

dren will result if "parents have intercourse before a burning candle, in a room near which many women work at a hand mill, immediately following defecation, after the letting of blood or recumbente marito. Also if they have intercourse with a child at the foot of their bed."^{6, 8} Intercourse during mensus,² onanism,¹⁹ difficult menstruation or amenorrhea,⁷ sometimes even pregnancy¹—all these have been stated as causing epilepsy. It is interesting to note that from the belief that seizures originate in the uterus we get our present day word "hysteria."¹

Epilepsy has been considered a visitation of the gods, the loss of the soul, and the possession by a devil.¹ There were many things that could be done to bring these states to an end and more to keep them from happening. There were so many different evil spirits indicted that a cure for one devil often would be useful for a number of different evil spirits. It is rather odd that while believing epilepsy to be caused by a demon, an occasional epileptic, during the same period in history, was considered to have been visited by a god (a rare privilege), which inclined him to prophetic activities and moving experiences. Some people believed that this caused the greatness of certain famous epileptics, such as Matthew, Napoleon, and Dostoevski.^{20, 21}

The simplest way to rid an epileptic of a demon was to bore a hole through which the demon could escape. Trephined skulls dating from the neolithic period have been found and are said to have been trephined for purposes of releasing demons.²² Trephining as a treatment for epilepsy is recorded down through the ages.^{9, 23, 24, 25, 26}

Human skull bones have long been reputed to do a fine job of curing epilepsy. There were many different manners of preparing these bones; charred, powdered, and in various mixtures.^{2, 6, 27} The bones that were supposed, by Paracelsus, to be the most useful were small suture bones of the skull,²⁸ the idea, apparently, being an oral prefabricated demon escape hatch.

Many ways were used to pin point the particular demon or god causing the trouble: "If a patient imitated a goat or ground his teeth, or if the right side was convulsed, Hera, the mother of the gods, was the cause. If the patient spoke in a sharper or more intense tone then he was likened to a horse and Poseidon was the cause. If any excrement was passed, the appellation of Euodius was at fault; if it was passed in small dense masses, like birds, Apollo Noimus was the cause. If foam was emitted by the mouth and the patient kicked, then Ares got the blame. Night tremors, frightful apparitions, and running away were plots of Hecate and Heroes."⁶

Hippocrates even goes further and cautions against wearing black as that is the color of Hecate.⁷

Areteaus says that epilepsy is called the sacred dis-

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ease not because it was caused by gods but because only gods could heal it,¹⁵ and Bernard of Gordon says of his inability to cure epilepsy, "I am ignorant, but God has knowledge."²

Before more demon causes of epilepsy are enumerated, it might be well to cite a method used to ward off epilepsy. Pliny says, "In cases of epilepsy we spit, that is, we throw back contagion."¹⁶ The idea of spitting is so strong that epilepsy was even called the spitting disease, and references are found even to the present day of the good of spitting.¹⁸

In Ethiopia care was taken lest the shadow of an enemy fall across the patient, causing epilepsy. Mohammedans believed epilepsy was caused by jinns, while the Turks believed the attacks were from spirits who were in love with the same one as the patient and the spirits were trying to throttle the patient in revenge.²⁹

Russian peasants believed a patient in a seizure was overpowered by a demon, and they beat the patient unmercifully with a sacred chain in order to force the demon to leave.⁶ The Hindus believed that Kura, the dog-demon, was the source and gave a nice prescription for a cure. This cure consisted of incantations, beating of gongs, and a ritual, all the while pouring a mixture of curds and salt water over the patient.²⁹

From the Christian world there are about as many fine methods of driving out the devils. From the Bible (Matthew XVII, 18) there is recorded the story of a boy who was brought to Jesus for help, "And Jesus rebuked the devil and he departed out of him and was cured from that very hour." This passage from the Bible has evoked a great deal of discussion through the ages. At one time it was quoted to show that epilepsy could be caused by demons.¹

From Scot we have this cure: "Take the sicke man by the hand, and whisper these wordes softlie in his eare, I conjure thee by the sunne and moone and by the gospell of this daie delivered by God to Hubert, Giles, Cornelius, and John, that thou rise and fall no more."³⁰

Another suggestion was that if you chance upon a patient in a seizure, bend down and whisper in his ear three times, "Gaspar bears the myrrh, Melchior the frankincense, Balthasar the gold. Whosoever bears with him the names of these three kings is delivered from epilepsy by the holiness of Christ."² Besides curing the seizure this verbal formula was said to cure the disease if the patient would fast, pray, and write the above on a paper and wear it around his neck. This probably was thought to cure the disease as the three kings *fell down* before Jesus.²

The first man to see a person in a seizure was to take off his right shoe, urinate in it, swirl it around

in a mixing motion, and give it to the patient to drink. John of Gaddesden goes even further and reports that the reason the first person seeing a seizure is the one to do the ritual is because of purely psychological reasons,²⁶ a bizarre finding in that age.

There were many patron saints to whom epileptics appealed. There was a ritual of attending Mass three times, saying certain prayers, and at times visiting the saint or his grave. Among these saints were St. Valentine, St. Nicetius, and St. Bibians. Some saints even passed out herbs, too.^{2, 6, 26, 27}

Another method of removing demons is quoted by Talbot. It shows that people, even in one method of treatment, did not put all their trust in the saint to get rid of the epilepsy.

"The patient first washes his limbs in a sacred well near the church, drops fourpence into it as an offering and walks three times around it, and repeats the Lord's prayer three times. Then a fowl, which was a cock or a hen, according as the patient was a man or woman, was put into a basket and carried first around the well and afterwards the church. Next the sufferer entered the church and lay down under the communion table till break of day. After that he offered sixpence and departed, leaving the fowl in the church. If the bird died, the sickness was supposed to have been transferred to it from the man or woman who was now rid of the disorder."⁹

The concept that epilepsy was transferable and contagious is seen throughout history, even to the present day.^{13, 18}

During the middle ages epileptics were not permitted to sell articles of food or drink.⁶ While epileptics were often looked upon as mentally ill, it was during this time that they were isolated from mental patients. This was done, not for the benefit of the epileptics, but for the mental patients, "since the sight of one epileptic attack may suffice to make a healthy person epileptic, how much greater is the danger for the mentally deranged who are so much more impressionable."³¹

Willis of the 17th century, who is reputed to be one of the pioneers in the evolution of modern neurology, is quoted as saying of epilepsy: "As often as the devil is permitted to affect miserable mortals with his delusions, he is not able to draw more evil arrows from any other quiver, or to show miracles by any better witch, than by the assaults of this monstrous disease."²³

The moon goddess, Phoebe, was early in history thought to cure epilepsy,¹⁵ but later she was left out and the moon itself was accused. As the moon waxed and waned, so also did epileptics have attacks. As late as 1861 Sienecking wrote, "Lunar influences are still upheld by some physicians of repute, and the

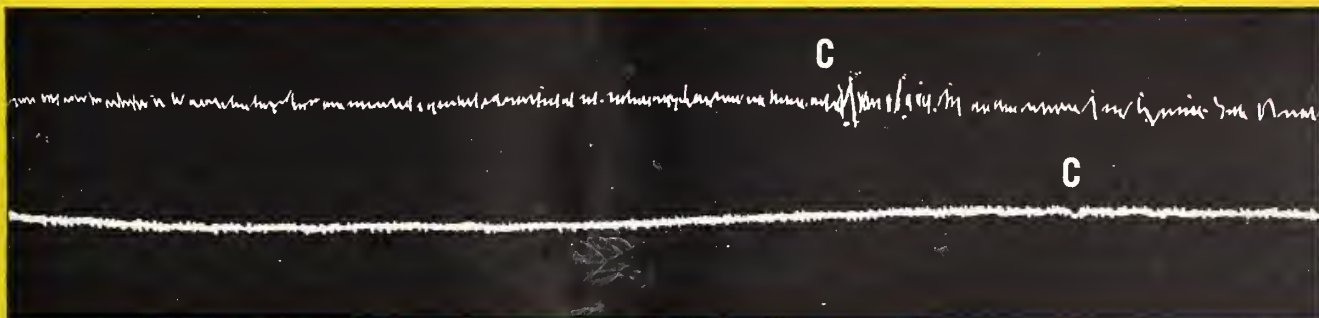
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belief is generally in vogue among the public. Epileptics were termed moony or moon struck."³² Pliny says that the moon attracts water to the brain, causing epileptic attacks.¹⁶

Richard Mead in 1704 wrote what was considered a learned and valuable treatise on the influence of the moon on humans. His work was useful as he allegedly could tell when sailors of the Royal Navy were going to have seizures "with tolerable certainty."³³ The belief that epilepsy was worse during the moon's phases was scientifically discredited in 1854 by Moreau's paper, for which he received a prize from the Paris Academy of Medicine. He showed of the 42,637 attacks observed by him, by actual count 26,313 were between the phases of the moon and only 16,324 during its phases.³³ And that takes care of the moon.

Realizing that these are but a few of the views about demons, gods, and epilepsy, we pass to other superstitions.

The highest order of animals used in the treatment of epilepsy is man. Human bones have been mentioned in connection with demons. Human blood has been used often in the treatment of epilepsy. Pliny tells that in ancient Rome epileptics drank the blood of gladiators "—as though from living cups, which looks very gruesome if there were also wild beasts in the arena. They think it most valuable to sip the blood still warm, still flowing from the wounded themselves and thus to imbibe the breath of life immediately from the fresh opening."¹⁶

Aretaeus Cappadonius describes epileptics assembled at the place of execution to lap up the blood of a just beheaded criminal.¹⁵ During the middle ages the act was followed by whipping the patients and making them run away as fast as they could after drinking the blood.⁶

Pliny advises rubbing the feet of an epileptic with virgin's menstrual blood as a means of reviving a person from a seizure.¹⁶

In Brunswick an epileptic child was to drink some of his own father's blood and in Denmark some of both his father's and his mother's blood.⁶ The executioners in Poland are said to have had an extra income by selling the blood of beheaded criminals as late as 1909.⁶

The brain of a child or human bone marrow was also advised by Pliny,⁶ and Kanner lists the following uses of human parts in the treatment of epilepsy: In the 13th century a dead man's tooth was believed helpful. The afterbirth of a first born child and scrapings of the vertebrae of a man killed by violence were prescribed. In Germany human perspiration is believed to bring a person out of seizures. From Maryland a strange magic procedure in which the patient's hair serves as a means to transfer the disease

from him to an inanimate object: Bore an augur hole into a piece of wood on a level exactly with the top of the sufferer's head; stuff into the hole some of his hair and plug it up.⁶

Enough of homosapiens and on to other forms of life used in past treatments of epilepsy. If the whole of the animals used for treatment were assembled, one would have quite a zoo. Particular reference was made to the whole animal as the following are some parts of animals that were prescribed: brain, heart, milk, liver, gall, testicles, urine, dung, claws, teeth, hide, horns and feathers.^{1, 6}

Kanner gives an alphabetized list of animals, about which he says, "I wish to emphasize that it is only a selection of the vast list of animals employed in the folk cure of epilepsy which is at my disposal."⁶ The list includes 67 different animals.

Now a few prescriptions in which animal parts were used will be listed.

Pliny advised the following prescriptions: Eat the heart of a black mule on the first or second day of the new moon; or ass's testicles drunk in ass's milk; eat a young dog still suckling, with wine and myrrh, after the head and feet have been removed; hawk's liver, hen liver, cock's testicles, pig's testicles in pig's milk. Strong persons may take 21 houseflies in a liquid medium; weak persons should not take so many. Lamb's gall, vulture liver drunk with vulture blood three times a day for seven days, or wear the heart of a vulture, caught while feasting on a human corpse, around the neck.¹⁶

St. Hildegard of Bingen gives the following: Take four parts of dried mole's blood; two parts of powdered duck's bill; one portion of the powdered claws of a goose, minus the skin and flesh. These constituents are bound together in a cloth, placed for three days near a mole track, for such earth is more wholesome—then they are put near ice to cool and then in the sun to dry. Cakes are then to be made with this powder and liver of some edible animal or bird and a little flour and cummin seed, and eaten for five days.

St. Hildegard even explains why these ingredients are used. She says: "Mole's blood is used because the mole sometimes shows himself and sometimes hides, like epilepsy itself. Duck's bill is added because it touches both pure and impure things with its bill, it is repugnant to this disease which is sudden and silent. Claws of a goose are advised for much the same reason and the claw of a goose rather than a gander because the female is the more silent of the two."¹⁹

Antonius Guainerius has this prescription to offer: "When a fit begins, kill a dog, remove its gall and give it to the patient in whatever way you can." Or: "For epilepsy, take a frog's gall and wrap it in a cab-

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bage leaf, dry it in the sun to make a powder and give to the patient mixed with a good wine."²⁷

Bernard of Gordon recommended that the cuckoo, after it has been placed in a jar and dried in an oven, be ground and given to a patient. This was said to be good because the cuckoo itself has fits and thus the poison will counteract the disease.¹⁷

The following quotation from Kanner is to show that wood lice were still being used in the 20th century: "In 1925 the old wife of a German innkeeper was accused of selling to epileptics white wine with wood-lice, that must have died in the wine; she was acquitted because the court assumed she believed in the efficacy of the remedy and therefore acted bona fide. . . ."⁶

Of the things vegetable that have been used, the one that has been recommended the most and for the longest period of time is mistletoe. The Hippocratic papers mention it, as does every other author writing of epilepsy. Even Gowers himself in 1881 had this to say about mistletoe: "This old remedy for epilepsy, praised by Paracelsus and by a considerable number of writers since his time, especially Calbatch and Frazer, I have tried in a considerable number of cases, but with beneficial results only in a case in which the attacks were apparently hysteroid."¹⁰

J. G. Frazer, in his *Golden Bough*, gives this explanation of the virtues of mistletoe: "As mistletoe cannot fall to the ground because it is rooted on the branch of a tree high above the earth, it seems to follow as a necessary consequence that an epileptic patient cannot possibly fall down in a fit as long as he carries a piece of mistletoe in his pocket or a decoction of mistletoe in his stomach. If I had not tried it, as far as the limited opportunities of an individual would admit, if I had not found it efficacious in epilepsy, even beyond my most sanguine expectations, I would not presume to offer it as worthy of the most serious attention."³⁶

Pliny states that mistletoe works much better if gathered on the first day of the moon without the use of iron and if, when collected, it was not allowed to touch the ground.¹⁶

Peony root or seed, worn around the neck or taken internally, is recommended by Galen. Garlic also has a long history in the treatment of epilepsy, dating from the fifth century and mentioned in the Bower manuscript.⁶

Blockwick prescribes elder as a treatment for epilepsy. He says: "If in the month of October, a little before the full moon, you pluck a twig of elder, and cut the cane between two of its knees or knots, in nine pieces and these being bound in a piece of linen, be it in a thread so hung about the neck that they touch the spoon of the heart or the sword formed cartilage; and, that they stay more firmly in place,

they are bound thereon with a linen or silken roller wrapt around the body, till the thread break of itself. The thread being broken and roller removed, the amulet is not at all to be touched with bare hands, but it ought to be taken hold of with some instrument, and buried in a place that no body may touch it."³⁷

In Russia lily of the valley is used; in China the rhammus root is preferred, and in Sumatra betel is given for epilepsy.⁶

P. Borel gave powdered soap-wart seed for three months at the time of the new moon, because the plant has a signature of its property, "for if rubbed in water it emits a soap like foam and is therefore profitable to the frothing epileptics."³⁸ Bernard of Gordon gives the following as having been used: endive, chicory, lettuce, hyssop, mountain laurel, physalis, anise, maratium, diagyrdum, bdeliu, rue, cloves, absenthe, and pyrethium.²

It would seem that if the plant is known, there is somewhere a prescription for it or a warning against the use of it.

Of the things mineral St. Hildegard says about the gem agate, "It should be soaked in water for three days at the full moon; the water should be slightly warmed and then preserved and all the patient's food cooked in it until the waxing of the moon; the gem should be placed in everything he drinks." This procedure was to be followed for ten months.¹⁹

Jade was worn by the Greeks, and emeralds were recommended by the Arabs, both prophylactically and therapeutically.⁶ Paracelsus recommends the emerald also.²⁸ Some believed if the violence of the disease were such that it could not be overcome by the gem, the gem broke into pieces.³⁹ Seligmann states that South American Indians of the Orinoco River place a piece of green feldspar in a wound which has been incised for the purpose in the skin of an epileptic; after the scar heals, the patient will be cured.⁴⁰ Paracelsus recommends white coral to be worn as a cure.²⁸

The swallow stone, which is found in a swallow's stomach at the beginning of autumn in the first quarter of the moon, reduced to powder and given in a liquid, was said to cure epilepsy.²

Antonius Guainerius practically guarantees a cure from the following prescription: Place some umbilical cord from a new born baby in a gold ring that has an emerald on it. As long as it is worn epilepsy cannot strike.²⁷

Of various metals that were used, iron filings were said to be good taken internally, or an iron nail driven at the spot an epileptic first fell would rid him of the evil.¹⁶

The use of zinc is of old origin. The Hindus give this prescription: First melt and then soak the zinc three times in succession in oil, whey, sour gruel,



The above advertisements appeared recently in Life, Saturday Evening Post, and Today's Health.

cow's urine, and lastly in the juice of okra. Melt the purified metal in an earthen crucible, adding to it powder of tamarind and banyan tree barks in the proportion four to one. Stir and rub then with an iron ladle. Mix with the powder an equal quantity of talaka (terasuiphide of arsenic) and triturate in an acid juice. Expose it to fire; again add one-tenth of its quantity to talaka, and again rub it and put it over a fire. Repeat the process ten times until the metal is reduced to bhasma.⁴¹

Gower also wrote, "Zinc unquestionably deserves some of the repute which it has enjoyed for more than a hundred years as a remedy for epilepsy."¹⁰

Table salt, antimony, and asphalt have also been used.⁶

Interesting points in regard to the use of minerals are the cramp rings and touch coins or sacramental shillings. Cramp rings were especially made rings which were to protect the wearer from epilepsy. The custom is said to have started when Edward the Confessor brought back from Jerusalem a ring thought to cure the epilepsy of those touching it. Later other rings were made; the best were supposedly those made from a nail or a screw from an old coffin, and certain prayers were said over them. The king then rubbed the rings between the palms of his hands, saying, "Sanctify, O Lord, these rings and graciously bedew them with the dew of thine benediction and consecration, and hallow them by the rubbing of our hands which thou hast been pleased according to our ministry, to the end that what the nature of the metal is not able to perform may be wrought by the greatness of Thy grace."

The rings were then passed out to the patient to be worn.⁴²

Of the sacramental shillings which were either carried or worn, Kanner quotes the *London Times* of March 7, 1854: "A young woman, living in North Devon, having for some time past been subject to periodical fits of illness, endeavored to effect a cure by attendance at the afternoon service at the parish church, accompanied by 30 young men, her neighbors. Service over, she sat near the porch of the church and each of the young men as they passed out dropped a penny in her lap, but the last instead of a penny gave her half-a-crown, taking from her the 29 pennies. With this half crown in her hand, she walked three times around the communion table, and afterwards had it made into a ring by the wearing of which she believed she would recover her health."⁶

Silver nitrate was used in the treatment of epilepsy, sometimes even to the point of argyria. Silver was used because silver is the color of the moon, and the moon was said to cause epilepsy.⁸

Other forms of treatment included bleeding the patient through various portions of his anatomy, different places depending upon the nature of the seiz-

ures.²⁶ The use of cautery at different levels of the body has a long history.^{8, 28} Counter irritants were used, including cantharides even to the point of blistering the parts.⁸

One last prescription: "Take a drachm of camphor, divide it into nine parts and give it to the patient to drink in his own urine, then bind on his navel a piece of toasted rye bread and let him sweat in a warm room in a bed well covered over."⁴³ No explanation is given with the above prescription.

In the words of Antonius Guainerius on the treatments of epilepsy: "If you do these things, it would be a very malignant epilepsy which would not forsake the patient after observing the prescriptions advised."²⁴

In conclusion let it be said that, bizarre as these "treatments" of epilepsy are, the people of their times took them in good faith and apparently got some relief. As has been said, the psychotherapy of getting a prescription tends to keep an epileptic from having as many seizures for a while.

It would seem wise indeed to keep this in mind and not to cast too many aspersions on these superstitions of treatment. One day in the future the very drugs being evaluated today, such as hibicon, phenuron, and mysoline, may appear in a paper on superstitions in the treatment of epilepsy.

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BOOK REVIEWS

Peptic Ulcer: Diagnosis and Treatment. By Clifford J. Barborka, M.D., and E. Clinton Texter, Jr., M.D. Published by Little, Brown and Company, Boston. 290 pages. Price \$7.00.

This monograph is complete, concise, and straightforward. It is excellent reading for those with a general interest in medicine and those with a special interest in gastroenterology. The discussion of pathophysiology is comprehensive and accurate. Principles of medical management are outlined in the light of the underlying known factors important in the clinical picture of peptic ulcer.

Prevention of recurrence and complications is emphasized, an aspect which is often slighted in the over-all management of the ulcer patient.

Indications for surgery are discussed clearly and are limited to the relatively few definite situations which are generally accepted as requiring the surgical approach.

This book might well be placed on the medical students' reading list along with his textbook of medicine.—A.P.K.

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COUNTY SOCIETIES

"Hospital Emergencies" was the subject of a panel discussion which formed the program for a meeting of the Shawnee County Society on March 5. Dr. Howard E. Roberts was moderator, and the participants were: Dr. Robert P. Woods, Dr. Robert M. Brooker, Dr. James A. McClure, Dr. G. Bernard Joyce, and Dr. Leslie L. Saylor.

Dr. Conrad M. Barnes, Seneca, president of the Kansas Medical Society, was speaker at a meeting of the Shawnee County Society held on April 2.

Members of the Geary County Society were hosts at a meeting of the Golden Belt Medical Society held in Junction City on April 5. A clinicopathological conference, presented by Dr. Vernon E. Wilson of the University of Kansas Medical Center, formed the program, followed by a dinner.

Members of the Pratt County Society were entertained by their wives at a buffet supper at the Park Hills Country Club on March 30 in observance of Doctor's Day.

Vice Admiral Ross T. McIntire (retired), executive secretary of the International College of Surgeons, was speaker at a meeting of the Sedgwick County Society held in Wichita on March 6. His subject was "Blood and Its Derivatives."

The group held its next meeting on April 3. At that time the speakers were Dr. Ralph C. Moore of Omaha and Dr. Charles Marsh of Valley, Nebraska. The subject of the program was "Medical Aspects of Highway Accidents." Dr. Conrad M. Barnes, Seneca, also spoke to the group.

"Income Tax Problems Relative to the Medical Profession" was the subject of a talk given to the Wyandotte County Medical Society at a meeting held on March 20. The speaker was Mr. George Sinder-son, C.P.A.

The Southeast Kansas Medical Society, composed of physicians in nine counties, met at the Armory in Iola on March 15 with members of the Allen County Society as hosts. Dr. Clarence H. Benage, Pittsburg, was principal speaker and others on the program included Dr. Conrad M. Barnes, Seneca, president of the Kansas Medical Society, and Mr. Oliver E. Ebel, Topeka, executive secretary.

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CHARLES L. DUNHAM, M.D., Washington, D. C., Director, Division of Biology and Medicine, Atomic Energy Commission

CHARLES HUGGINS, M.D., Chicago, Ben May Laboratory for Cancer Research

DWIGHT H. MURRAY, M.D., Napa, California, 1956-57 President, American Medical Association

EUGENE P. PENDERGRASS, M.D., Philadelphia, Professor of Radiology, University of Pennsylvania School of Medicine

GRANT H. SANGER, M.D., New York, Francis Delafield Hospital, Cancer Research Laboratories

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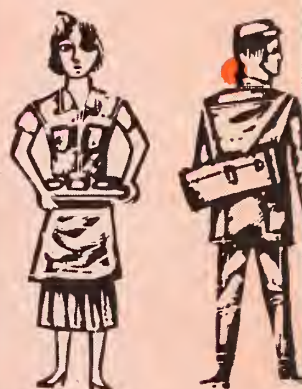
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A meeting of the Lyon County Society was held at Emporia on April 2. Dr. Robert G. Rate, Halstead, discussed "Cancer of the Lung."

Physicians of the Russell County Society entertained members of the societies in Ellis and Ellsworth counties at a meeting at Russell on April 5. Two speakers from Kansas City, Missouri, provided the program. Dr. Alexander Moruzi spoke on surgery of the stomach, and Dr. Milton H. Noltensmeyer discussed different types of anesthesia.

Cost of Hospital Care

A prediction that hospital costs would "continue to increase at about five per cent annually for many years" was made recently by Mr. Ray E. Brown, president of the American Hospital Association. The prediction is based on his belief that there will probably be no significant decrease in the general economic situation.

"Only by the best efforts of hospital boards, administrators, medical staffs, and all members of the hospital team can costs be held within that level of increase," he said. "Whatever answers there are to the problem of hospital costs must be found in the area of personnel budgets."

"The nature of the hospital's work provides little opportunity for productivity gains. Nonetheless, hospital salary levels are affected by general salary levels. Under such circumstances every round of salary increases constitutes a direct increase in hospital costs."

Increases in hospital services calling for added equipment and personnel are another factor in the rising cost picture. The largest increase in personnel is attributable to new services. Cursory studies made on this question indicate that the number of routine procedures per patient day has increased more than 30 per cent in the past nine years.

The cold war against tuberculosis calls for a clear-cut program for the future. It is regrettable, that in our satisfaction with the fall in death rates, we may have given the impression that tuberculosis is conquered. In fact, some in authority have said that the fight is as good as over and that there will be no tuberculosis problem in ten to twenty years. This breezy optimism is founded on lack of knowledge and misunderstanding of the problems involved. Tuberculosis, while it has lost many of its death-dealing features, is still the greatest single cause of loss of man-hours in young people and still disrupts thousands of homes.—George J. Werrett, M.D., *Nat. Tuberc. A. Tr.*, May, 1954.



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ANNOUNCEMENTS

Physicians are invited to attend the seventh annual Dr. F. G. Thompson, Sr. lectureship at the Thompson, Brumm and Knepper Clinic, St. Joseph, Missouri, at 8:15 p.m. on Monday, May 21. Dr. William Dameshek, professor of clinical medicine at Tufts College Medical School, Boston, will discuss "The Spleen and Hypersplenism."

The Children's Hospital of Philadelphia, 1740 Bainbridge Street, Philadelphia, will present three courses in May and June: (1) Pediatric Advances, May 28 through June 1, tuition \$100; (2) Practical Pediatric Hematology, June 4, 5, and 6, tuition \$60; (3) Blood Group Incompatibilities and Erythroblastosis Fetalis, June 7 and 8, tuition \$50.

The 22nd annual meeting, American College of Chest Physicians, Hotel Sherman, Chicago, June 6-10. Write the College, 112 East Chestnut Street, Chicago 11, Illinois.

Fifth annual symposium for general practitioners on tuberculosis and other chronic pulmonary disease, Saranac Lake, New York, July 9-13. Twenty-six hours credit by A.A.G.P. Fee \$40. Write Dr. Edward N. Packard, P. O. Box 262, Saranac Lake, New York.

July 15 is closing date for Ames Award Contest for papers on gastroenterology written by fellows in gastroenterology, residents, and interns. Winning entries, carrying awards of \$400 and \$250, to be selected by Research Committee, American College of Gastroenterology. Address inquiries to College, 33 West 60th Street, New York 23, New York.

Applications being accepted now and until October 1 for candidates for certification by American Board of Obstetrics and Gynecology. Address inquiries to Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6, Ohio.

The 84th annual meeting of American Public Health Association and 40 related organizations, Convention Hall, Atlantic City, November 12-16. Write the Association, 1790 Broadway, New York City.

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*Fishberg, A. M.: Hypertension
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Lea & Febiger, 1954, pp. 177-178.

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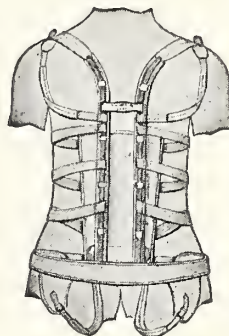
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Hospital Cancer Programs

A properly functioning registry of cancer patients is a requirement for approval of a hospital's cancer program by the American College of Surgeons under new regulations which are now effective, the Committee on Cancer of the College announced recently.

The program considers a hospital's cancer activities only and is entirely separate from the Joint Commission on Accreditation of Hospitals, of which the American College of Surgeons is a member organization.

Minimum requirements for approval of a cancer program in a general hospital conducting organized cancer clinical activities include a cancer registry, cancer consultation, and treatment service. Smaller hospitals are required to maintain only a registry of all cancer patients. All types of programs must be supervised by a committee of the hospital's medical staff.

The registry must include the name and address of every patient upon whom a diagnosis of cancer is or has been previously made, with adequate diagnostic information and an abstract of the clinical record. Annual follow-up notes must be maintained as long as the patient remains alive. College requirements also specify procedures for maintaining the registry and methods of developing the case abstract file. Sur-

veys are made regularly to make certain that standards are maintained. Six hundred twenty-five hospitals in this country are now approved.

Paintings on History of Medicine

Parke, Davis and Company recently announced completion of arrangements for 40 oil paintings depicting major events and personalities in the medical profession during the past 5,000 years. The artist, Robert A. Thom, and the editor, George A. Bender, will require at least five years to complete their work. The new series will complement the "History of Pharmacy in Pictures," commissioned by Parke-Davis in 1951 and soon to be finished.

Appointments to Faculty

The following appointments to the staff at the University of Kansas School of Medicine were announced recently: Dr. Charles M. Poser, Dr. Max Musgrave, Dr. Marjorie Spurrier Sirridge, Dr. Tom Chin, and Dr. Albert Decker as instructors in medicine; Dr. Truman B. Schertz, instructor in ophthalmology.

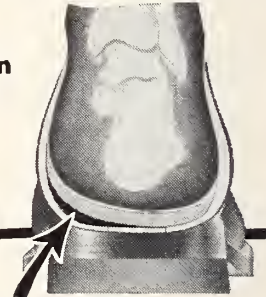
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Health Insurance Coverage

Nearly two out of every three men, women, and children in the United States now are protected by voluntary health insurance, according to the ninth annual survey made by the Health Insurance Council, New York. Figures used in the report were those of December 31, 1954.

Progress in coverage during the past year indicates that at this time some 104 million persons have voluntary protection against hospital expenses, 89 million have surgical expense insurance, and 50 million have insurance for medical expense.

Benefit payments on health insurance claims reported by the survey for 1954 exceeded \$2.7 billion, a gain of 11 per cent over the previous year. More than half went to help meet hospitalization expenses of beneficiaries, and more than \$730 million paid for surgical and medical care. Benefit payments to policyholders by insurance companies for loss of income due to disability were in excess of half a billion dollars last year.

Of the aggregate benefit payments in 1954 by all forms of voluntary health insurance, 56 per cent came from insurance companies. The dollar amount paid by the companies was more than \$1.5 billion, including loss-of-income benefits.

Blue Cross and Blue Shield type plans paid more

than \$1 billion, or 39 per cent of the total. Various independent plans accounted for the remaining 5 per cent of the total.

On December 31, 1954, a total of 101,493,000 Americans had hospital expense protection. This represents an increase of 4.3 per cent during that year, a rate of increase which is over $2\frac{1}{2}$ times the rate of population growth in the same period. Since the beginning of 1941, the number of persons with hospital expense protection has multiplied nearly $8\frac{1}{2}$ times.

Nearly 86 million persons had surgical expense protection by the end of 1954. This represents an increase of 6.1 per cent over the previous year. Ordinarily, people with surgical coverage also have hospitalization protection. So, up to 85 per cent of those with hospital expense protection also had surgical coverage. Since 1941, the number of persons with surgical insurance has multiplied about 16 times.

Regular medical expense coverage increased by more than four million persons, or nearly 11 per cent during 1954, to give a total of more than 47 million who have this protection against the cost of non-surgical medical care by their doctors. People with medical expense protection usually have hospital and surgical protection as well.

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major medical expense insurance—is shown by the survey to protect more than 2.2 million persons against the costs of catastrophic illness. This figure represents a gain of 83 per cent during the past year.

The best statistical estimate as to prevalence of tuberculin reactors in the United States is that about one-third of our population, roughly 50 million people, are reactors. In other words, about 50 million people harbor virulent human tubercle bacilli which probably will produce active disease at the rate of about 100 new active cases per 100,000 reactors per year.—*James E. Perkins, M.D., Bulletin of National Tuberculosis Association, January, 1956.*

Hospital deliveries increased from 37 per cent in 1935 to 92 per cent in 1952, reports the U. S. Department of Health, Education, and Welfare.

The Food and Drug Administration of the Department of Health, Education, and Welfare announced recently that it will hire 48 temporary investigators to carry out a special assignment to enforce the law against possible "black market" distribution of the Salk poliomyelitis vaccine. An appropriation of \$300,000 was made by Congress to cover the expenses of the program.

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TABLE OF CONTENTS

JUNE, 1956

Scientific Articles		Tumor Conference—Islet Cell Tumors 356	
Transportation of Injured—John A. Grove, M.D., Newton	336	Senior Thesis—Spontaneous Arterial Thrombosis—R. Glenn Snodgrass, M.D., Portsmouth, Virginia	382
Emergency Room Care—Thomas P. Butcher, M.D., Emporia	338		
Abdominal Injury—Richard E. Speirs, M.D., Dodge City	340	Editorials	
Lower Extremity Fractures—Charles K. Wier, M.D., Wichita	342	Fatal Fallacies	353
Burns—A. E. Hiebert, M.D., Wichita	344	Tetanus in Kansas	353
Head Injuries—William P. Williamson, M.D., Kansas City	348	Life Insurance	354
Ocular Emergencies—Byron J. Ashley, M.D., Topeka	350		
		Miscellaneous	
		President's Page	352
		Just Browsing	355

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Special Issue on Trauma

The 1955 meeting of the Kansas Chapter of the American College of Surgeons, in keeping with the College emphasis on trauma, was devoted to various aspects of that subject. The program was arranged by Dr. John A. Grove, chairman of the State Committee on Trauma.

During the presentation of the papers on that program, it was evident that they were on timely subjects which would be of interest to a great number of the physicians of Kansas. Thus the idea of this issue on trauma was conceived.

The papers by Doctors Grove, Butcher, Speirs, and Hiebert are essentially as presented on that occasion, and the one by Dr. Wier was given in a modified form. The contributions of Doctors Williamson and Ashley were solicited to round out the symposium.

The Editorial Board is pleased to be able to present this special issue and hopes that it will prove to be interesting to a large cross-section of the membership of the Society. Appreciation is extended to all the authors who made it possible.

Transportation of Injured

If You Are Injured near Your Home, Will You Be Satisfied with the Available Ambulance Transportation?

JOHN A. GROVE, M.D., *Newton*

It is a pleasure, as chairman of the Kansas Committee on Trauma of the American College of Surgeons, to present this panel today. One of the most active committees of the American College of Surgeons is its Committee on Trauma.

Briefly, I wish to review and refresh your knowledge of the work of this committee since its inception in 1922. It was at first a small group named the Committee on Fractures. Among the men most active in its work, the name of Charles L. Scudder stands out. There were, and are still, many other men prominent in the work of the College of Surgeons who have served on the committee. This first group may be called the men of the era of "splint them where they lie." In 1939 the committee was amalgamated with the Committee on Industrial Medicine and Traumatic Surgery, under the name of the Committee on Fractures and Other Trauma. In 1950 the name was changed to the Committee on Trauma, and its membership was enlarged to 45 men.

The objectives of the committee are to improve and develop the teaching of trauma in the United States and Canada, and to improve the transportation and care of the injured person. As a means of carrying out the objectives, regional committees have been established in as many parts of the United States and Canada as possible; there are 12 sections, each of which is made up of three, four, or five states. Over each section, the chief acts as advisor and as director of the various states' activities. There is no standard procedure as to how each state works out its problems of organization. Local regional committees in the larger centers may be organized. In fact, throughout the east, there are many local committees at work. Membership is not limited to members of the College.

In Kansas, your committee has made its prime objective the improvement in the management of injured. This is to be carried out through three objectives: (1) first aid; (2) emergency room management, and (3) definitive treatment.

I wish to speak briefly today about one part of first aid—the transportation of injured in Kansas. There are times when I feel a gentle needling does a great amount of good so if, as I proceed, you feel some mild sticks, I hope you will take it in the way that it is intended, to stimulate some action.

Recently, in a nationally-published magazine, there was an article by Greer Williams entitled "Let Those Crash Victims Lie." It was blunt in saying that more damage can at times be done in transportation to the hospital than at the time of the crash. Our people need more education of this type. However, let's look at the evidence.

The "Dr. George Curry" quoted in the article is from Flint, Michigan. He is chairman of the subcommittee on transportation of the injured for the Committee on Trauma of the College. Recently he made a survey of transportation of the injured in 28 large and 34 smaller cities across the United States. These 62 cities, large and small, covered one-fifth of the population of the present United States census.

Of the larger cities, 56 per cent were rated good for the transportation of the injured, 15 per cent were excellent, and 29 per cent were fair to poor. Of the smaller cities, and there were four that were surveyed in Kansas, 46 per cent were good, 25 per cent excellent, and 29 per cent fair to poor. Comparing metropolitan areas with the more rural population, in which class we fall, there seems to be no great variation in this report.

The situation here is evaluated on the following (and I want you to think about this question, because I want you to answer it in your own minds): "Do you believe, if you sustained a serious accident in your own city, that you would be transported to a hospital in a way conducive to your promptest recovery?"

Think about that a minute! Figure out your own ambulance service and your own transportation services. You're knocked out, you have a head injury, you have no direction over events. You also have a fractured femur. Do you think, in your own city, you would be transported to a hospital in a way conducive to your promptest recovery? I wonder, in answering that question honestly, whether all of us aren't just a bit worried about the answer.

Now, just to make you feel a bit better, in Chicago, with medical facilities and teaching institutions, the survey in 1954 showed that 69 per cent of emergency room cases of trauma got to the emergency room without organized help.

Let's look again at Kansas. There are almost no municipal ambulances in Kansas. Patients reach the

emergency rooms by private car, by private ambulance, or they walk in. An answer from a Kansas town surveyed by Dr. Curry included this comment, "Most of our cases of highway trauma occur in isolated areas, remote from people or telephones. It has been almost impossible for an ambulance or medical care to beat the first well-meaning persons to the scene and keep those individuals from bundling the living or the dead into the car and racing to a hospital."

The obvious question, of course, is how much added trauma has needlessly occurred. I know that if you are in the emergency rooms of our hospitals each day, you see accident cases and cases of trauma of all kinds brought in with hurry and rush by well-meaning individuals, but certainly adding to the injury. Now, a cynic among us might pose the question, "What if the average doctor did reach the scene? How much first aid can and will he practice? Will he splint those fractures?"

Obviously the doctor would stop major bleeding. Among the war-trained doctors, the aid will be good and the patient fortunate; but I wonder about the young men just out of medical school. Has their training been as good as it should be, in medical school and in their internships? What about the older doctors? I'll just leave that with a question mark.

What happens if the average Kansas ambulance reaches the scene? Less than one-third of the ambulances in Kansas are equipped with splints. You look in the ambulances of your home town (and that includes the metropolitan centers and on down) and see if there are splints in those ambulances. The vehicles themselves have 250 horsepower, they are long and red or black, and they have loud sirens and bright lights, and they can go 100 miles per hour; but what, other than a stretcher, do they have inside them? They may have an oxygen tank. Slip around to one of them sometime and turn the tank on and see if there is any oxygen in it!

What about ambulance personnel? Are they trained? My own survey of ambulances in the state of Kansas shows that less than one-tenth of the ambulance attendants in Kansas have had even a rudimentary first aid training, and those men are mostly war veterans. The attitude has been, "Dump them in and let's get going; we can't waste time tying on splints. We haven't a board in the ambulance, if we have a back injury; and we wouldn't know what to do if an airway was stopped up and obstructed. Just pile 'em in, and get 'em to the hospital!"

The morticians run more than 95 per cent of the Kansas ambulances. In questioning them, I get these answers: "Our personnel is shifting. We do not have long enough time to train them." "Our ambulance calls are money-losers unless we pick up a dead one. It just doesn't pay to make an ordinary ambulance

call." "Splints cost money. Who's going to pay for putting those splints in the ambulances?" "No one has complained about the way we take care of the injured. No one has offered to train us."

I have been rather destructive in my approach so far, and it is time to become constructive. What can be done about the 38,000 dead on the highways each year, and what can be done about the 1,250,000 injured?

In Kansas today already 380 are dead on the highways this year, and I will have to revise that because I think there were six more in the last 24 hours. Specifically, the Committee on Trauma is pushing better care and, again, transportation, emergency room care, and definitive care.

Listed below are five suggestions for providing good transportation of the injured.

1. A central dispatching agency for ambulances is advisable. The police, with their two-way radios and through the telephone operator, offer a logical central dispatching agency.

2. We need a concentrated effort to equip ambulances with splints and oxygen. There are certain ambulances in counties in Kansas that are equipped with splints, because interested physicians have placed them there. The morticians, I find when I contact them, are perfectly willing to have splints placed in the ambulances as long as they don't have to pay for them. Local civic groups in most areas are always looking for some project that is worth while for them to aid, and certainly equipping ambulances in these towns would be a good endeavor. We can get splints in the ambulances.

3. Ambulances should be manned by two attendants; one man cannot handle four, five, or six injured individuals, and he certainly can't carry a fat lady down from second floor, even with the aid of the family, as satisfactorily as would be possible if he had a trained attendant with him.

4. We need training of ambulance attendants. The local Red Cross first aid instructors are always willing to help, and in many cities the help of local police and firemen can be obtained. All they need is a spark; they need a drive to push that spark on, and they are happy to be of assistance.

5. Lastly, we need voluntary adherence to a code for those running ambulances, incorporating the above. In places such as Flint, Michigan, and other cities, they have by ordinance required their ambulances to carry splints and to have trained attendants. In many cities like Chicago, where they have an ordinance, it is like prohibition; it just is hard to legislate these things into existence and active use. Voluntary adherence is the way that it should be done, but if it can't be done that way, certainly local city ordinances can be worked out.

Now to the second objective of our Kansas Committee on Trauma—emergency room care. There are several points that I briefly want to go over: first, seeing that hospital staffs know that their emergency rooms are available, are equipped, and used. You would be surprised how emergency rooms deteriorate. The College of Surgeons, through its accrediting of hospitals, has made a point of stressing emergency room set-ups in the various institutions, and it is a part of the surveys that are being made today for accrediting of hospitals.

Second, we need more training in the care of trauma in medical schools. I think (and all of you, I believe, would bear me out) that most of the young men coming out of medical school are eager to know more about what to do with trauma. If they are going to learn by trial and error, certainly that is unfair not only to those individuals (the students), but it is also unfair to the patient.

Third, where interns are available in hospitals, the hospital staff has to take the responsibility of teaching them the care of trauma. I have, personally, known of patients coming out of our largest hospitals in Kansas being transported to another hospital with fractures that were not splinted by the interns in charge of the emergency rooms of those hospitals. There is no excuse for that.

The fourth point is postgraduate and circuit courses in the care of trauma. I feel that all of us are a little inclined to pass off some of the primary lessons in handling trauma; but I believe that they can be repeated again and again and do all of us a considerable

amount of good, including removal of our mental cobwebs. As the first aid and emergency room care of trauma goes, right there the entire course of the case is determined.

It might be interesting, if you would go to the emergency room of your hospital and follow a case of injury from the time the patient gets to the door, to see if transportation of that injured person within the hospital is carried out properly. How is the patient moved to the x-ray table? How is he moved to the operating table? How is he transported between bed and table and examining areas? It is rather surprising, sometimes, to see how attendants bundle the patients up and how they handle them.

As for definitive care in the hospital, again, postgraduate instruction is a prime objective. We need more papers on trauma at our Kansas Medical Society meetings, and we of the Kansas Committee on Trauma of the College of Surgeons certainly appreciate the opportunity of bringing this program here today.

I hope that in being rather blunt I have not offended; but if offense has been done, measure it carefully. Ask yourself honestly, "If I am injured in my own city, am I going to be satisfied with the way I am transported to the hospital?" If you can answer that question honestly, and believe that you will be, then we have reached the objective for which we are striving.

Axtell Clinic
Newton, Kansas

Emergency Room Care

What Facilities Should Be Available without the Delay of a Long Search? Do You Have Them?

THOMAS P. BUTCHER, M.D., *Emporia*

When I was asked to discuss this subject I thought, "This emergency room business is a kind of stepchild of surgery. The emergency room itself is a kind of stepchild of the operating room. It gathers a lot of dust from day to day, and even when it gets business it doesn't always get cleaned out very well. I will not attempt to run through any kind of a general survey of an emergency room; rather I'll take the lead that has been given us and ask you some ques-

tions, and I hope again that you will try to answer these for yourselves. Perhaps in one or two instances, for a few of you, this may strike home.

A story is always a good way to get attention, and medicine, of all places, lets you tell more stories than most fields—well, the lawyers have it on us. They, I think, do a little better at that than we do. Let me begin with some case histories, not in any great detail but because they point up certain things so we

can briefly catch the highlights. These are based on fact. Most of them did not take place here, fortunately.

One is that of a 72-year-old riding academy attendant who was kicked in the throat while cleaning out the stables. He was seen by the doctor on the ambulance within perhaps 45 minutes of the time of injury and was taken to a hospital. On the way in to the hospital it was evident that he had received a rather severe contusion of the throat, probably of the larynx. Upon arrival at the emergency room of the hospital, the doctor who had made the ambulance call said to the people in the emergency room, "Get a tracheotomy set ready because this fellow may get enough edema to shut off his wind. And tell the folks on the floor where he is admitted to be sure to have a tracheotomy set ready."

Within 24 hours the man was dead of laryngeal edema because, when it became apparent to the doctor taking care of that particular service that the man was obstructing, the tracheotomy set was not available and nobody knew where it was, and nobody had enough initiative to cut off the end of a fountain pen cap and shove it in there.

Do you know, individually, where you can put your hand on a tracheotomy set in five minutes in your hospital, any one of you? Just ask that of yourselves. Does your house supervisor know where the tracheotomy set is?

I tried this on our home institution and dropped down at lunch yesterday and talked to this very lovely young lady and said, "What about the tracheotomy set?"

"Oh, we've got it. It's right there in central supply."

"That's wonderful. I'm glad to know it. I didn't know where it was and now I do, and I don't want to get caught not knowing again."

About three o'clock in the afternoon the telephone rang and she said, "This is Miss Blank. I'm awfully sorry. We thought that tracheotomy set was down in central supply. We found out it's in a closet upstairs just off the nose and throat section."

"Well," I said. "I'm glad to know that. Are you sure it's there?"

"Yes," she said, "we've seen it."

"Fine," I said. "We'll put that down then as the place the tracheotomy set is kept. It doesn't matter where it's kept. It's just a matter of knowing where it is."

The second case was a young man 24 years of age with first and second degree burns received from a flash flame while he was working with some gasoline in the garage. He was taken to the hospital with 20 per cent burns estimated. He was anesthetized and

his burns were debrided. Within three hours the man was dead. Why did he die?

At autopsy it was found that he had beans, meat fibers, and corn filling his tracheobronchial tree. He had been taken to the hospital and he'd had a gas machine mask slapped on his face in order to have his second degree burns cleaned up. He vomited because he had just eaten. He suffocated from the vomitus that he sucked back into his lungs because the anesthetist was going to do her job well. Struggle or not, she was going to see to it that he got that anesthetic.

How many of you can put your hand on a suction machine within five minutes after you walk into the door of your hospital—one that works, not just one that's been sitting there for a couple of years and never been tried out in that time? I think it's pretty generally agreed now, and the anesthetists have impressed this upon us here in Emporia where we have what we believe is high grade anesthesia, that we just don't put people like that to sleep any more.

I can remember when we'd keep an ethyl chloride tube in the top drawer of the desk in the office. Some little kid would come in with a cut, and you'd "whiff" him with ethyl chloride and sew up his cut. I don't think we've given a general anesthetic under those conditions, at least I don't know of any having been given, for a long time now. Local anesthesia, if anything is necessary, works very nicely. Certainly for the person who has not had time for gastrointestinal preparation, a general anesthetic or the pentothal anesthesia is a real hazard and one not to be treated lightly.

One more story—that of a man who, many years ago, sustained compound comminuted fractures of the left lower leg and foot. He had avulsion of a large portion of the skin of the sole of the foot and at various other points along the leg and thigh, with very deep lacerations of the thigh.

He was hospitalized, primary closure was done, and he went along for a couple of days with doubtful circulation, no dorsalis pedis pulse on that side. It was felt that if amputation became necessary, spontaneous demarcation would help decide the level. On the third post-injury day he developed fever of 102 or 103, his pulse went to 160, his blood pressure went to 200/120, and he became highly toxic.

On his admission he had had tetanus and gas antitoxin prophylactically. Massive doses, several million units a day, of gas antitoxin were started, and amputation was performed on the fifth day following injury. Convalescence was stormy, but he recovered. The point is obvious. We don't do primary closures on things of that sort. And we do perform debridement of devitalized tissues.

How many of you can walk into your hospital and put your hand on a stomach pump, and on British anti-lewisite (B.A.L.), if that's indicated in poisoning? How many of you can find a wall chart that will give the antidotes for the various types of poisoning and a book listing the common drugs that are available and their chemical constituents and antidotes when they are toxic?

A young man, a Marine, was riding as a passenger in a car of a young Negro who had picked him up in San Francisco. They arrived near Peabody. The Marine was driving the car, he went to sleep, and the car hit a culvert. As is so often the case, he sustained typical compression fracture of the chest with paradoxical respiration. He was about gone with inability to ventilate. This doesn't require any special equipment except that you need a nice big wood screw to put into the sternum and to which you can hang 10 to 20 pounds of weight to pull it forward. That

was all that was necessary to give this man a chance to breathe comfortably.

How many units of plasma, or better still perhaps since plasma has come into some disrepute, plasma-like substitutes (dextran or gelatine) are available in your hospital in the event of a catastrophe? There happen to be 19 in one of our hospitals. That would help us along for a while. It probably isn't enough. How many do you have at hand, ready to go, in the event that an airplane crashes into a theater or a stadium collapses? You can get almost any amount flown down to you in an hour or so from supply depots in Kansas City.

It is better to think these things through now so that when the time comes for action, we may act well.

Emporia Gazette Building
Emporia, Kansas

Abdominal Injury

Basic Principles of Management of Various Types of Abdominal Trauma

RICHARD E. SPEIRS, M.D., Dodge City

Injuries to the abdomen have many causes. These include stab wounds, gunshot wounds, falls, and automobile accidents. In the latter the possibility of intra-abdominal injury must always be considered. Frequently stab wounds and gunshot wounds show definite intra-abdominal injury that requires immediate care. These offer no particular diagnostic problem.

Not infrequently penetrating wounds appear to be superficial, and the responsibility for determining the depth of these injuries falls squarely upon the physician. Probing of such wounds is inaccurate as changing positions shift the muscles and fascia, closing the hole. The most difficult cases are those seen following automobile accidents or farm injuries where there has been a blow to the abdomen without evidence of penetration or contusion to the abdominal wall.

The association of abdominal trauma with fractures frequently results in neglect of the abdomen because of preoccupation with more obvious injuries. The counterpart of this is the extra-abdominal condition which produces physical signs simulating those in actual abdominal injuries. Examples are fractures of the spine, pelvis, and ribs, ruptured kidneys and diaphragm, retroperitoneal hematoma, or hematoma of

the abdominal wall. In these conditions it is mandatory that the presence of abdominal injury be ruled out.

Because of these contradictory and complicated findings it behooves us, when first seeing the patient, to examine him carefully from head to toe. This is best done by setting up a routine for the examination. It will require but a few minutes and should be completed before emergency or definitive treatment is started. By establishing a definite routine a physician is not likely to care for obvious injuries and neglect those that are not immediately perceptible. The unconscious patient further complicates the diagnosis.

Signs of abdominal injury may be slow in developing. It is frequently necessary to sit by the side of the patient and examine him continuously—looking for any change in his condition—before it is possible to say that this person does or does not have an internal injury. The rapidity of development of signs will depend largely upon the extent of abdominal injury. The severely injured and shocked patient may not react normally to the spillage of bowel contents into the abdominal cavity, and rigidity from a torn bowel may not be immediately discernible.

For general purposes the contents of the abdominal cavity can be divided into (1) solid organs such as the liver, spleen, and kidney; (2) hollow organs such as the stomach, intestine, and bladder, and (3) the supporting structures such as the mesentery of the large and small bowel and the blood vessels contained therein.

The principal danger in injury to the solid organs and the supporting structure is from hemorrhage. The spleen is notorious for the deceptive manner in which it bleeds. Normally it is a soft, friable organ. Its vessels do not retract as do those in a muscle. After spontaneous cessation of the hemorrhage, increasing blood pressure may blow out the soft clot with a resultant secondary hemorrhage. For this reason hemorrhage from a ruptured spleen is sometimes delayed for one or two days, and it is not uncommon for a secondary hemorrhage to occur between the seventh and 14th day post-trauma.

The liver will act in a somewhat similar manner, although the hemorrhage is usually obvious at an earlier period than with the spleen. It must be remembered that blood going into the peritoneal cavity is physiological and does not necessarily cause severe peritoneal reaction as do contents from the intestinal tract.

Peritoneal manifestations resulting from rupture of a hollow viscus depend upon the contents of the organ at the time of rupture. The stomach that is distended is much more likely to burst with a blow than is the empty one. The contents of a full stomach will cover the peritoneal cavity much more rapidly than the contents of one that is partially empty, giving rise to more immediate and more severe manifestations.

The chemical constituents of the stomach and upper intestinal tract are more irritating than pathogenic organisms and give rise to an immediate reaction. In the colon the liquid portion of the intestinal content is greatly decreased, and spread of that spillage is less violent than spread from the proximal bowel. Signs of a ruptured colon are somewhat dependent upon the infection that results, which partially accounts for delay and difficulty in diagnosis.

The occurrence of some visceral injury remote from the site of the force can be accounted for by the attachment of the mesentery or adhesive bands which do not give with the application of force.

In the examination of injured patients one must look for rigidity of the abdominal wall, although a patient who is unconscious or in shock may lose this valuable sign. A patient with a fractured rib or chest injury will have rigidity of the abdominal wall, but this rigidity is usually unilateral and there is a relaxation with respiration.

Intestinal peristalsis frequently indicates whether or not intra-abdominal injury is present. Generally speaking, peristalsis is decreased by reflex inhibition with the discharge of either blood or intestinal content into the peritoneal cavity. Occasionally, early after an injury, there is markedly active peristalsis of the intestine as a result of irritation of the peritoneum. Peristalsis can be diminished as a result of edema from contusion of the intestine without actual rupture.

Fracture of the thoracic spine can closely simulate intra-abdominal injuries. This is principally due to the fact that the abdominal parietes receive their innervation from the lower six thoracic nerves, which supply the abdominal wall. Injuries to these nerves may produce referred sensory pain, tenderness, hyperesthesia, and spasm to the involved segments. However, there is usually tenderness and deformity over the spine at the site of injury, and this is not seen in true abdominal injuries. It is important in all cases to examine the spine carefully for evidence of a fracture.

Traumatic rupture of a kidney will show localized tenderness over this kidney, and frequently a definite asymmetry can be seen in the flank as a result of accumulating blood. In most ruptured kidneys the urine will be bloody, but this is not necessarily so. If the ureter is torn and the distal portion retracts so that blood cannot gain entrance into the urinary bladder, there will not be blood in the urine. Rupture of the bladder secondary to over-distention, or from a fragment of the pelvic bone, can also produce bloody urine.

X-ray examination is of great aid in the diagnosis of trauma. It will reveal fractures of the ribs or the spine, free air in the peritoneal cavity, or separation of the loops of the intestine signifying that some abnormal fluid is present in the peritoneal cavity.

A fracture of the lower ribs denotes that a severe impact has occurred, suggesting the possibility of a ruptured liver or spleen. A ruptured spleen will give an increased area of density in the left subdiaphragmatic space. It is also reported as causing a notching effect upon the left border of the gastric shadow. Occasionally the left diaphragm is elevated, and atelectatic areas in the left lower lung field or contused areas from the original impact are visible.

The diagnosis of abdominal trauma can be difficult. Skill, patience, and clinical judgment will be severely taxed in the doubtful case. Even with all facilities available, one cannot always make a definite diagnosis. In such cases abdominal exploration may be wiser than procrastination.

First National Bank Building
Dodge City, Kansas

Lower Extremity Fractures

Simple but Effective Splinting Is the Key to Safe Transportation and the Avoidance of Complications

CHARLES K. WIER, M.D., *Wichita*

Emergency treatment of fracture in the lower extremities begins where the patient is first seen. This emergency should provide the following:

1. Morphine or Demerol for relief of pain (if medically qualified personnel is present).

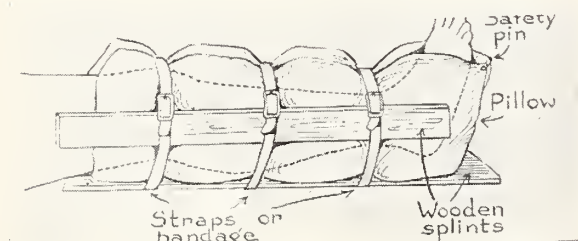


Figure 1. Pillow splint. Good for any fracture from ankle to knee. Practically no danger of circulatory disturbance results from its use. (From Key and Conwell *Fractures, Dislocations and Sprains*, the C. V. Mosby Company, St. Louis.

2. Supplying of adequate immobilization by any one of the methods illustrated (Figures 1 and 2). Splints correctly applied:

- A. Further reduce pain.
- B. Prevent additional soft tissue damage.
- C. Prevent added shock.

3. Compound wounds should be covered with the cleanest material available to prevent more contamination.

4. Control of bleeding by means of pressure dressing (a tourniquet is rarely necessary).

5. Not until these steps have been accomplished should the patient be moved for immediate conveyance to a hospital. Upon arrival there treatment for present or impending shock should be started immediately.

Shock invariably follows major fracture of the long bones caused by great violence. It is made manifest by a rapid pulse, thirst, profuse sweating, anxiety, and, lastly, by a falling blood pressure. In fractures in which there is much deformity and much swelling, there is considerable "concealed bleeding." Shock can be forestalled if treated early. Symptoms may be due to loss of blood or to a decrease in blood volume caused by extravasation into the soft tissues.

Intravenous fluids are to be given in the following order of preference: (Whichever is used, it should be run in rapidly through a wide open 19 gauge needle if the blood pressure is falling. When the pressure is raised to normal, the rate of flow is decreased.)

1. Whole blood (start dextrin or one of the electrolytes while the patient is being typed and cross matched).

2. Serum albumin.

3. Dextrin.

4. Plasma (if urgently needed and 1, 2, or 3 blood is not immediately available).

5. Saline and glucose solutions will raise the patient's blood volume temporarily, but they will not maintain it indefinitely. However, their use may save a life while 1, 2, or 3 blood is being obtained.

6. Oxygen is given as indicated.

In early shock, the patient's response to treatment is usually quick and gratifying; in the case of profound shock of long duration, the condition may be "irreversible" and may not respond to treatment. However, with modern therapy irreversible shock is rarely seen.

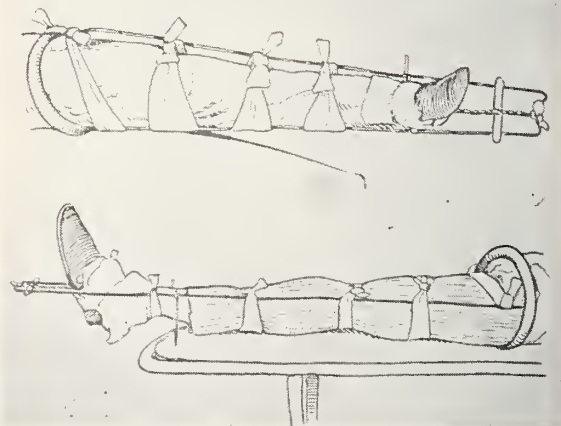


Figure 2. Thomas splint applied for emergency. Top—anteroposterior view. Bottom—lateral view. Distal end of splint is held off stretcher by metal support, box, or pillow. End of splint may be hung from roof of car or ambulance. (From Bancroft and Murray *Motor Skeletal System*, J. B. Lippincott Company.)

Traction is one of the oldest and most effective ways of immobilization for correcting deformity, and occasionally for reducing the fracture.

Skeletal traction is more effective and more comfortable than adhesive traction and can be initiated with a local anesthesia. Given a patient with multiple fractures of the lower extremity, under local anesthesia, without moving the patient, insert a one-eighth inch Steinmann pin through the os calcis and attach an "ox bow" to the ends of the pin. The leg is then gently lifted into a Thomas splint, and weights are attached to the ox bow. This routine may be considered definitive treatment, but it is also good emergency treatment and is applicable to any leg fracture from the ankle to the hip (Figures 3 and 4).

In dislocation and fracture dislocation of the hip, there is no sharp line of demarcation between emergency and definitive treatment. Pain is usually intense, and the only relief is to obtain reduction as soon as the patient's condition will permit. If a closed reduction should not be possible, then an open reduction should not be delayed too long, especially if



Figure 3. Details of traction with Kirschner wire or Steinmann pin through os calcis. There is no stretch on the skin. (From Key and Conwell *Fractures, Dislocations and Sprains*, the C. V. Mosby Company.)



Figure 4. Lower extremity in a Thomas splint with traction applied through pin in os calcis. Ring of Thomas splint is suspended to overhead frame, omitted for clarity. Method affords immobilization of fractures and correction of deformity. A good "overnight" method of treating one or multiple fractures until definitive methods have been decided upon. (From Key and Conwell *Fractures, Dislocations and Sprains*, the C. V. Mosby Company.)

there are vascular or neurological complications discernible, such as a cold foot, loss of extension of toes, and anesthesia of the foot and leg.

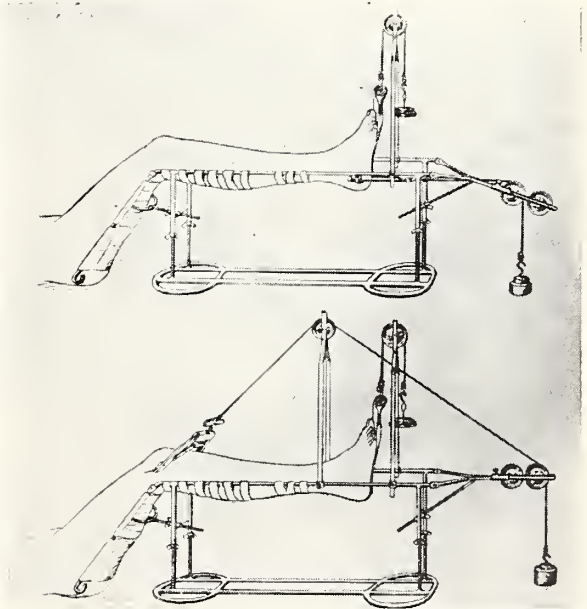


Figure 5. Zimmer modification of Boehler-Braun splint, padding omitted to show detail. Top—for use in lower leg fractures with pin through os calcis. Bottom—for use in fractures of femur. Pin can be inserted through condyles of femur or through upper tibial crest. These are handy splints to have in any hospital and simplify obtaining x-rays by portable machine. (Courtesy Zimmer Manufacturing Company, Warsaw, Indiana.)

Pelvic fractures may be complicated by a ruptured bladder, almost always made manifest by a rigid lower abdomen, or by bloody urine on catheterization. It is well to leave the catheter in position if gross blood is obtained.

Injuries of the spine, abdominal area, chest, head or neck should be looked for and treated without delay. These injuries may require more immediate definitive treatment than the extremity itself.

Emergency treatment for compound fractures must also include the process of converting a contaminated wound to a clean wound. It has been our experience that compound fracture wounds are best cleansed by using the method of Henry who advises a "shower bath" for the wound rather than a tub bath. After all the skin surrounding the area of the wound has been adequately cleansed with soap and water, while the wound is protected from further contamination, then the wound itself is copiously irrigated with either a saline solution spray or a spray of soap and distilled water. The object of this routine is, in the main, to remove gross contamination.

While the wound is being irrigated, threads of devitalized tissue float up into the wound and can be removed with a sharp knife. Other obviously devitalized muscle is excised. Gown, gloves, and instruments are changed, drapes are applied, and the wound is further explored and enlarged if necessary so that adequate exposure can be obtained.

Foreign matter, if ground into the fragment ends,

is removed with a rongeur. Loose bone fragments are removed. The result should be a clean appearing, well vascularized wound.

Whether the wound is left open or closed depends on the time lapse since the injury was sustained, the degree of contamination, the judgment of the doctor, and the condition of the patient. All vital skin on the lower leg should be saved, as in this area there is very little relaxed skin. If the wound is closed, it should be with the skin and subcutaneous tissue only, with no tension. Relaxing incisions may be necessary. It is not advisable to close wounds which are more than four hours old. Internal fixation in compound wounds is not recommended. After the wound has been treated, immobilization is obtained as in a closed fracture.

SUMMARY

Fractures of the lower extremity may be followed by shock. For adequate treatment, morphine may be given for pain. After the fracture has been splinted, the patient may be moved to a hospital where shock may be treated through the use of whole blood, serum albumin, or dextrin. Not until the patient's general condition will justify it, is definitive treatment to be started. During the emergency period the patient should not be put through painful movement just for an x-ray when there is an obvious fracture.

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Burns

The Care of Severely Burned Patients Must Be Maintained At an Emergency Pitch for the Duration of Treatment

A. E. HIEBERT, M.D., Wichita

No surgical emergency requires more deliberate medical acumen than the complete management and care of the patient with an acute severe burn. Paradoxically, under the pressure of circumstance, there is little time to deliberate. It behooves us therefore to be prepared in advance with definite patterns of conduct, which should not be static but constantly open to modification and improvement.

No claim to originality is made for this paper. It is rather an attempt at compilation of some of the more recent accepted practices in the treatment of burns. These are presented in a more or less didactic form, in the hope of starting an immediate integrated

regimen. The policies of the first few hours may have much to do with the life or death of the patient.¹ Much of this may seem trite, but it is still important to go through with the "fire drill."

THE ACUTE EMERGENCY

This may happen to any of us. The excited hospital emergency nurse calls and says, "Doctor, four severely burned patients have just arrived. Will you take over at once?" You have 10 or 15 minutes to think while you madly rush to the hospital. What must you do? You must collect yourself now, for once you arrive there will be the turmoil of frantic relatives, in-

quiring police officers, tense bustling hospital personnel, and four very sick patients, all seeking your undivided attention. While you are still taking a mental inventory, you arrive at the hospital. You dash by understanding officers, give a reassuring nod to the relatives, and then see the patients. Suddenly you must draw on every resource that medicine has to offer.

IMMEDIATE EMERGENCY CARE

1. Make a quick survey and determine the relative priority of patients and of procedure. (Children with more than 8 per cent and adults with more than 15 per cent of body surface burned are considered serious).

2. Give a narcotic for pain. The injection is made intravenously to give prompt relief and to avoid dangers of secondary cumulative effect. Use the normal dosage. In the aged use light dosage to obviate unnecessary depression. Remember that deep burns are less painful than superficial ones.

3. Cover the patient with clean sheets. Avoid blankets and quilts as these are usually contaminated.

4. Treat existing or impending shock. All burn patients suffer shock in varying degrees, which becomes manifest in 30 to 45 minutes after the onset of the burn. If practical, assign a house officer to each of the patients, or secure the help of medical colleagues so that therapy may be simultaneous.

A. Start an intravenous drip of normal saline solution or Ringer's solution.⁷ If shock is present or the cubital veins are not available because of burns, cut down on the great saphenous vein just anterior to the medial malleolus. A size 19 needle, or better still a size 18 polyethylene tube, may be inserted and ligated in place. (This latter tube should be ready in advance in the emergency room. It should be about 15 or 20 centimeters long and have fixed to one end a suitable adaptor for the intravenous apparatus.

B. While getting into the vein, draw blood for matching, and start a transfusion as soon as possible. Plasma may be used at once if it is known to be safe.

If shock continues to increase, speed up fluids, especially the electrolyte. Guard against hyperhydremia, especially in the aged.

5. Insert an indwelling catheter for hourly measurement of urinary output. (The hourly output should be between 25 and 60 cc. To regulate this, fluids are either increased or decreased).

6. If oxygenation is poor, make sure there is no mechanical obstruction to respiration and use aspiration if necessary. If the color of the patient is poor,

because of impaired circulation, give intranasal oxygen. (Insert an intranasal catheter as deep as the distance from the nose to the ear, and give from 4 to 6 liters of oxygen per minute).

7. If there are aspiration burns, a tracheostomy may be done so as to be better able to aspirate secretions.

8. Give 1500 units of antitetanic serum, or, if the patient has had active immunization, a booster dose of toxoid, while the patient is still in the emergency room. (Tetanus has later developed in some cases where this was taken for granted but had been neglected.)

9. Antibiotics need not be given, except for specific indications.

10. Local Care: While all these other attentions are given, local treatment should not be neglected. The immediate concern should be for making the patient comfortable. Aseptic technique is used, personnel wearing masks and gloves. The patient's tight clothing is loosened and irritating substances removed. Before starting definitive treatment, examine the patient for other injuries, such as fractures, hemorrhage from open wounds, or other obvious disease.

Definitive treatment: For most burns, especially the extensive ones, we prefer the exposure treatment. Smaller areas, which permit ambulation, may be dressed with bland coverings. If a tight occlusive dressing is applied to an extremity, care should be exercised not to cause a tourniquet action proximally, which may cause edema and later fibrosis distally.

SECONDARY EMERGENCY CARE

Once the patient is safely in bed, the doctor may catch his breath and pause to reflect on the separate problems of each individual patient. General policies are set forth in the following. Individual variations can be made to suit each particular case.

1. Make a diagrammatic body surface chart, showing the extent and degree of burns. Estimate the per cent of burned body surface according to Berkow's method, or the "Rule of Nine."

<i>Rule of Nine:</i>	<i>(For Adults)</i>	<i>(Children 0-2 Yrs.)</i>
Head and Neck	9%	18%
Upper Extremity	9%	
Lower Extremity	18%	11%
Front of Trunk	18%	
Back of Trunk	18%	
Genitalia	1%	

2. Secure from the history or estimate the weight of the patient in kilograms.

MINIMAL FOOD NEEDED DAILY BY PATIENTS WITH THIRD DEGREE
BURNS, ACCORDING TO THE TOTAL AREA UNHEALED

<i>Burn Area Per Cent</i>	<i>Protein Grams</i>	<i>Calories</i>	<i>Ascorbic Acid Grams</i>	<i>Thiamine Mgs.</i>	<i>Riboflavin Gms.</i>	<i>Nicotinamide Gms.</i>
20 plus	300-400	5000	2.0	50	50	500
10-19	200	3500	1.0	25	25	200
5-9	125	3000	0.5	15	15	100
1-4	90	2500	0.5	10	10	50

should be taken to avoid accumulations of pus under the eschar. (Pyocyanous bacteria thrive on a dirty wound.) We have largely preferred exposure treatment,¹⁰ even when the burn is circumferential. Sticking of wounds to the bed clothes is prevented by the liberal use of powdered aluminum sprinkled on the bedding and patient.⁹ A Stryker bed helps in the nursing problem.

As soon as possible, skin grafting should proceed. Sharp debridement will hasten sloughing. As soon as areas of clean granulations appear, and the general condition of the patient permits, autogenous grafts should be applied. If large areas are involved, the patient's life may be saved by use of homografts from live donors or from the skin bank.² Once the skin covering has begun, the patient's condition improves increasingly. Raw surfaces on hands or about joints should receive priority, to avoid deep fibrosis, contractions, and fixations. Burns about hands, when not too extensive, can be debrided initially and grafted at once.⁵ This is especially applicable to mangle burns, which are always deep.

Grafting about the orbits should be done early to avoid ectropion and corneal damage.

SUMMARY

An attempt has been made to outline some general principles in the treatment of burns. These may

be varied with conditions. There should be no let-down in the care and attention from the excitement of the first few days until the burn is healed. This problem is greater than any one specialty in medicine.

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There is nothing funny about accidents. But there is a grim humor implicit in the foolish, immature lapses of otherwise sensible men and women, which are by far the greatest single cause of our highway horror. . . . Every one of us is capable of error. We are all subject to fallacies in thought and deed. Our message to you as a driver or a pedestrian is that all too often these fallacies can be fatal.

*The Travelers 1956 Book of
Street and Highway Accident Data*

Head Injuries

Most Patients Can and Should Be Treated in the Locality Where Injured. There Are Few Indications for Surgical Intervention

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The management of intracranial injuries is a task which can, should, and must be handled by the general surgeon or general practitioner with few exceptions. Transporting the patient to a distant neurosurgeon may entail great risk to life, and in the majority of cases, competent management of the situation by the local physician will save more lives than will transfer of the patient to a distant specialist.

The indications for actual surgery in intracranial injuries are relatively few and usually readily recognized. They are only three in number:

1. *Depressed skull fracture.* This type of fracture is usually compound, since a blow severe enough to produce localized depression of bone also causes a laceration of the scalp directly over the area of depression. The diagnosis is made readily by inspection and palpation. Insertion of the gloved finger into a scalp laceration should be an absolute "must" before suture of any scalp laceration. A depressed skull fracture can be diagnosed routinely in this way and demands definitive surgery immediately, mainly to prevent the complication of meningitis, cerebritis, or brain abscess.

The repair of compound depressed skull fracture demands simply the general surgical principles of thorough debridement of the wound, including the brain, and water-tight closure of the dura, replacement of bone fragments in their relatively normal position, and closure of the scalp in layers, without tension and without drainage. To drain such a wound is to admit improper debridement and only allows an avenue for the entrance of infection. Depressed fractures over the sagittal sinus, torcula, or sigmoid sinus should be referred to the specialist because of profuse bleeding that occurs upon their elevation. Depressed fractures into the nasal air sinuses demand removal of sinus membrane and careful watertight dural closure.

2. *Extradural or middle meningeal hemorrhage.* This is the syndrome of head injury with unconsciousness, followed by lucid interval of consciousness, with subsequent development in a matter of 4 to 24 hours of headache, vomiting, stupor, coma, ipsilateral dilated pupil, contralateral hemiplegia, and then death. It must be remembered that if the initial blow or concussion is severe enough to produce

unconsciousness for several hours, the lucid interval will not be present. Equally important is the fact that the initial contusion or laceration of the brain may produce any neurological condition, including a dilated pupil or hemiplegia; it is only when these signs progressively develop several hours after the injury that one can assume extradural hemorrhage to be present.

For this lesion immediate surgery is indicated, consisting of temporal craniotomy, removal of blood clot, and control of hemorrhage. This is handled best by the neurosurgeon, but time rarely will allow long distance transportation, and life will depend upon immediate local surgery.

3. *Subdural hematoma.* This lesion is rarely present during the acute stage of the head injury and usually causes progressive headaches and visual disturbances weeks or months after injury. These patients usually develop papilledema and localizing signs, and the lesion is verified by arteriography, ventriculography, or trephination of the skull. Simple drainage is curative.

Any head injury not presenting the above surgical indications must receive medical management, which is directed at supportive measures assisting body defenses against brain injury. Certainly we cannot alter the presence of the damage that already has been done. The general care of the patient is, however, exceedingly important and often determines whether the outcome shall be life or death. The following features are worthy of note:

1. *Position in bed and airway.* With the head elevated, intracranial pressure is lowered, venous drainage of the brain is improved, and cerebral edema is lessened. The head of the bed should be elevated unless the depth of coma is so great that cough reflexes are abolished. In this case, the patient will drown from his own tracheobronchial secretions, which always are excessive in serious intracranial injury. Thus in unconscious patients it is essential that the head of the bed be flat, that the oropharynx and trachea frequently be cleared of secretions, and that the patient be kept on his side with frequent turning to allow postural drainage. Endotracheal suction can be carried out by inserting a catheter through the nose into the trachea. It can be left in place and intermittently

aspirated. If the physician is not certain that the airway is adequate, then tracheostomy is indicated and has saved many lives.

2. *Oxygen.* This should be administered by nasal catheter, or preferably by tent, to all unconscious head injury patients for at least the critical period of two or three days.

3. *Fluids.* Intake should be maintained initially to the average daily amount of 2000 cc., which may be given by vein or subcutaneously. Intensive dehydration no longer is in vogue. Fifty cubic centimeters of 50 per cent glucose, sucrose, or albumin should be reserved for those patients who, at 12 to 36 hours from injury, show evidence of increasing intracranial pressure due to cerebral edema, with deepening stupor, slowing pulse, and absence of localizing signs. Once started, hypertonic solutions should be continued every six hours until the stage of edema has passed, which usually is about four days. Even while receiving hypertonic solutions the patient must have an adequate fluid intake. Blood or plasma should be administered if shock is present, which is rare in brain injury alone. The presence of shock should alert the physician to the probability of other systemic injury, such as ruptured abdominal viscus.

4. *Nutrition.* For two or three days fluids may be maintained by intravenous therapy alone. If the patient is still unconscious after three days, nasal gastric tube feedings should be instituted with adequate caloric and vitamin intake, as well as fluids.

5. *Sedation.* This must be held to a minimum, as it depresses respiration, deepens stupor, and interferes with evaluation of the patient's condition. Morphine is contraindicated. Small repeated doses of sodium phenobarbital usually suffice. Occasionally, the wild maniacal patient requires paraldehyde. Restraints usually serve only to agitate the patient and increase thrashing and restlessness.

6. *Spinal puncture.* Lumbar puncture serves little purpose in either diagnosis or treatment, and in the presence of increased intracranial pressure actually may be dangerous. It is not advocated as a routine.

7. *Chemotherapy.* Administration of antibiotics plays an important part in prevention of infection

and should be routine in compound depressed skull fracture, spinal fluid leak from nose or ear, and in the comatose patient as an aid to prevent pneumonia.

Simple linear skull fracture that is not depressed or compound in itself requires no treatment. Spinal fluid leak from nose or ear usually heals itself and requires only prophylactic chemotherapy. Active effort to cleanse the nose or ear should not be made; a simple loose sterile dressing over the external ear will suffice. Irrigation or plugging the ear with cotton aids intracranial extension of infection.

Children are more likely to survive critical intracranial injury than are adults and should never be called hopeless until dead. They often go through desperate neurological situations such as decerebrate rigidity, hemiplegia, unequal pupils, and stertorous respiration, only to be found clinically well a few hours later. Conversely, in elderly patients the prognosis must be exceedingly guarded, as they will maintain a fair neurological state for several days and then gradually develop a downhill course and die from cerebral softening. Intoxicated patients with head injuries are exceedingly difficult to evaluate and require careful observation.

Patients who, when first seen, have bilateral dilated and fixed pupils almost invariably die from severe brain stem contusion. Patients with mild head injuries may be allowed up as soon as they feel like it. Prolonged bed rest serves only to increase psychosomatic elements of post-concussion syndrome.

X-rays play little part in evaluation or management of head injuries. Linear fracture is of no significance, and the basal fracture is diagnosed by bloody spinal fluid draining from the ear. The depressed skull fracture is diagnosed by palpation, and the patient is then taken to surgery where the fractured elements are visualized directly. Certainly the patient with critical head injury should never be moved or handled solely to get x-rays. In brief, other than the above mentioned supportive measures, the less done for the serious intracranial injury the better.

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Fatal Fallacy: Dry roads and sky clear.
Step on the gas and have no fear.

*The Travelers 1956 Book of
Street and Highway Accident Data*

Ocular Emergencies

Proper Recognition of the Type and Extent of Injury Is Imperative

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In this day of speed, increasing industrialization, and the use of mechanical devices on the farm and in the home, injuries to the eye are common. In 1935-1936, the United States Public Health Service showed that 51.9 per cent of all uniocular blindness and 20.6 per cent of all bilateral blindness was due to accidents.

Many eye injuries occur in conjunction with other injuries and are seen by men not specializing in this field. The manner of examining and treating the eye at this time is important. In all except a few emergencies, the vision should be obtained in each eye separately, even if you use only a magazine. In addition to being diagnostic, this is important because a person may not know his vision is poor in one eye and will blame the loss on treatment. A history is helpful in deciding treatment.

A good light is essential, a small pencil light, flashlight, or a condensing lens. Because of blepharospasm, examination is much easier after instillation of an anesthetic such as $\frac{1}{2}$ per cent Pontocaine or Dorsacaine, 2 per cent Butyn or 5 per cent cocaine solution. Care should be used in opening the lids so that no pressure is exerted on the eye ball. Some form of magnification such as a loupe, reading glass, or plus 15 lens on the ophthalmoscope may be necessary to see small foreign bodies on the cornea.

Small abrasions of the cornea may require staining. This can be done by using a dye such as 2 per cent fluorescein or 2-5 per cent Mercurochrome solution and washing off the cornea. You should be certain the former is sterile.

The lower fornix can be examined by pulling the lower lid down. To examine the upper fornix, the lashes of the upper lid are grasped, then pressure is exerted high on the upper lid and, with the patient looking down, the lid is extended and turned back on itself. (To release have the patient look up.) This exposes the tarsus and sulcus near the lid margin which is a favorite site for foreign bodies. It is well to have an applicator prepared as the foreign body may move when the lid is released. This inspection and examination is quickly done and may often save an eye.

Two-thirds of chemical injuries are due to contact action, and in these, time is the important factor. Regardless of whether the injury is produced by acid or alkali, the eye should be irrigated with water as soon

as possible to dilute the chemical and with enough force to remove particles. This irrigation should be continued for 15 to 30 minutes.

A further search for particles and their removal should be made by the physician, with particular attention to the fornices.

Analgesics should be used sparingly as most inhibit epithelialization and may even injure the corneal epithelium and increase the damage. Antibiotics such as 30 per cent sulfacetimide or 4 per cent Gantrisin can be used four to six times a day.

If there is severe conjunctival damage, the necrotic material should be removed and a mucous membrane graft used after 48 hours.

MECHANICAL INJURIES

Foreign bodies in the conjunctiva may move around. They cause most discomfort when under the upper lid near the margin. They can be wiped off without an anesthetic. To remove a foreign body from the cornea, an anesthetic should always be used. Any foreign body that can be wiped off could also be irrigated off and usually with less damage to the epithelium. Those imbedded in the cornea should be removed with a sharp pointed instrument such as a spud or sterile 22-24 needle on a syringe. A good light and magnification are essential.

The patient should keep both eyes open, fixing a point with the uninjured eye to avoid movement. It is well to touch the eye so he will understand it won't hurt and will be relaxed. Your hand should be steadied on his face and the instrument advanced parallel to the cornea so any movement on his part will not cause you to injure the eye. The foreign body should be then lifted off. If a rust ring is left, this should be removed by gently scraping (remember the cornea is only one mm. thick). This may be more easily visualized by frequently closing the lid over the cornea. If the rust is not easily removed, it can be touched with silver nitrate or 20 per cent trichloroacetic acid and removed at a later date. Occasionally it is safer to leave it.

A corneal foreign body in a child may require a general anesthetic for removal. If this is not possible, the foreign body can be allowed to slough out, in the meantime using an antibiotic ointment, homatropine drops, and a tight eye patch.

After removal of a corneal foreign body, an anti-

biotic such as sodium-sulfacetimide solution is instilled and a firm patch is applied. It is well to explain to the patient that he has a larger exposed area now to cause pain than he had before, so if pain recurs the only way to relieve it is to cover the other eye with a folded cloth, tie a cloth around the head over both eyes, take an aspirin, and be quiet for a couple of hours.

Corneal abrasions found by staining are treated in the same manner.

CONTUSION

An eye may be severely damaged by a blow from a blunt object and yet show very little externally. Often there may be blood in the anterior chamber. The pupil may be irregular and slightly dilated. If the media are clear, hemorrhage and edema may be seen in the retina.

If there are no lacerations or abrasions, no medication locally is required. Rest is the best treatment, and the best way to secure eye rest is a firm binocular bandage. Hemorrhage may occur after several days and is often severe. It may be accompanied by increased intraocular tension which will require the care of a specialist.

Perforating injuries are a serious condition and require hospitalization, x-ray examination, and operative repair.

LACERATIONS

Repair of lacerations of the lid should be accomplished in the first day or two. Contracture soon sets in, and what might have been a simple procedure becomes difficult and causes more deformity. No tissue should be removed unless absolutely necessary. Fine

silk sutures are used. If the wound is vertical, a suture through the lid margins will help to realign the lids, then the tissue can be closed in layers, using fine catgut for the buried sutures.

If the cut is through the canaliculus, Sheie places a nylon suture into puncta canaliculus, through the sac, and out through the skin. This is tied in a loop after the skin is closed.

A laceration of the cornea is often accompanied by prolapse of the iris. If the iris is exposed, it should be pulled out a little and cut off flush with the cornea. If enough tension was used it will withdraw back into the anterior chamber. If it is just caught in a corneal wound, it can be pushed back inside. Large corneal wounds require sutures using 6-0 silk or catgut on the fine cutting needle.

Smaller openings can be closed by a conjunctival flap as follows: circumcision of conjunctiva at limbus for one-half the circumference, then undermining for 6 to 7 millimeters. This is drawn over the corneal laceration and sutured at the limbus. It will retract in 7 to 10 days. Atropin and antibiotics are used. It is well to cover both eyes the first day.

Permission should be obtained for an enucleation before you start to explore a badly injured eye.

The following are some of the indications when enucleation should be seriously considered:

1. Laceration through center of cornea extending into sclera and ciliary body, with damage to lens and vitreous; poor light projection.
2. Severe damage to eye with posterior perforation and poor light perception; intraocular foreign body.

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Fatal Fallacy: One for the road at the end of the day
Sharpens the wits and eases the way.

*The Travelers 1956 Book of
Street and Highway Accident Data*

Fatal Fallacy: The straightaway is the safer way.

*The Travelers 1956 Book of
Street and Highway Accident Data*

PRESIDENT'S PAGE

DEAR DOCTOR:

What is Public Relations?

It could be described as that continuous effort consciously exerted to create better public opinion.

The past years have found public relations playing a big part in every business field. This is also true in medicine.

The public desires to know more and more about medicine and its progress. It is therefore necessary to meet this demand.

A better understanding and cooperation is the best therapy in treating the disease. It is necessary for each of us to be a public relationist.

If we keep this in mind, I am sure our relationship with the public will be much improved.

Fraternally,

Clyde H. Miller M.D.

President

P. S. Be sure to register so you may vote for the party of your choice.

EDITORIAL COMMENT

Fatal Fallacies

Editor's Note—"Fatal Fallacies" is the title of the 22nd edition of a highway safety booklet now being distributed by the Travelers Insurance Companies, Hartford, Connecticut. The entire content of that booklet would be appropriate in this issue on trauma, but space permits the use of the following editorial only.

Safety was in the news in 1955. But death and destruction made the headlines. With foresight and ingenuity, safety was built into our automobiles to an extent never before accomplished. With skill and inventiveness, compelling slogans of care were broadcast through every medium of communications. With indifference and utter unconcern, the motoring public produced the greatest number of casualties in highway history.

Because of a slight decrease in deaths and injuries in 1954, there seemed some cause for optimism. However, this proved to be another of those fatal fallacies which characterize the field of highway safety. For in 1955, we compiled the regrettable total of 37,800 deaths, an increase of $6\frac{1}{2}$ per cent over 1954, and 2,158,000 injuries, an increase of 10 per cent over 1954. Thus, the trend has reversed itself in what was the most safety-conscious year in our history.

These blunt and bloody statistics again substantiate the often repeated thesis of these booklets. In driving, there is no substitute for self-reliance. Safety belts, special padding, and other mechanical features all help but reliance on them is a fatal fallacy. Straighter, wider roads are welcome but reliance on them is a fatal fallacy. Reliance on the other driver or pedestrian to follow the rules of the road to the letter is a fatal fallacy. And by definition, a fatal fallacy is a mistaken belief that leads to disaster.

This is not to dismiss all the advances that have been made in alleviating the seriousness of accidents. Every one of these steps is a stride in the right direction. But it is the driver's mind harnessed to his reflexes; plus his body harnessed to his seat, which is going to produce fewer accidents. It is brainpower not horsepower; the power to steer and brake; not power steering or power braking which is the ultimate solution to the safety problem.

Again in 1955, we saw repeated the fatal fallacy of safety by decree. While the President's official S-D Day served a worthwhile purpose in focusing attention on our distressing highway habits, it did not cause the slightest decrease in the day's casualties.

With individuals, businesses, and all media of communication emphasizing safety, the nation's motorists and pedestrians went about their business as usual. And as in 1954, S-D Day was followed by the most devastating Christmas weekend in history.

Toward the end of 1955, a serious attempt was made in some parts of the country to penalize more drastically those who deliberately flout the law. Stricter enforcement is a welcome trend, as it places serious practical difficulties in the path of the habitually careless driver. However, it would be a fatal fallacy to believe that punishment, any more than reward or appeal to the higher instincts of individuals is the sole solution to a mounting accident rate.

Safety is more than a slogan. It is an attitude of mind and a way of life. And as the road of all virtues is strewn with temptations, so is the path of safety. We call them fatal fallacies. The following are a few of the deadliest.

Pitting speed of reflexes against the modern automobile's super-horsepower.

Feeling free to "pour it on" on the straightaway, no matter how clear the day, how dry the road, how straight or wide the highway.

Driving while intoxicated or weary in the vain hope that the homing instinct will assure safe arrival.

Reliance on built-in safety features to compensate for lack of care.

Believing, with the supreme confidence born of experience, that rules of the road are meant for beginners.

These are just some of the fatal fallacies which caused grievous death and injury on the highways of America in 1955. More than 80 per cent of all casualties occurred in accidents where there was some driving violation.

This leads to the inescapable conclusion that accidents do not "just happen." And to believe that avoidance in the past means immunity in the future is the most fatal fallacy of all.

Tetanus in Kansas

In the past five years, 11 deaths were caused by tetanus in Kansas. In addition, there have been 14 cases reported in patients who survived.

This is a tragic story to relate about a disease which is preventable. The Kansas figures far exceed the number of cases and deaths from tetanus which occurred in the entire U. S. armed forces during World War II, despite the large number of casualties.

We all know that temporary passive immunity can be provided through the administration of 1500 to 3,000 units of tetanus antitoxin to an injured person. This will usually suffice to prevent the disease when given at the time of an accident.

We also all know that tetanus toxoid given in a series of two or three injections, approximately a month apart, will build long-term immunity. Then, at the time of an injury, the patient can be given adequate protection by a "booster" or recall injection of tetanus toxoid, rather than having to receive the more dangerous horse-serum antitoxin.

Immunization is best accomplished in infancy by giving three injections of tetanus toxoid, combined with pertussis vaccine and diphtheria toxoid. In adults it can be accomplished by immunization with tetanus toxoid, alone, or in combination with diphtheria toxoid.

In either instance, active immunization affords the opportunity to give a longer lasting, higher degree of protection without resorting to horse-serum.

A recent survey in one Kansas county revealed that fewer than 20 per cent of the entering first graders were adequately immunized.

As physicians, we must do something about this. We must immunize as many people as we can, particularly infants, but not be neglectful of any adults or older children we can reach.

Tetanus toxoid recall injections should be given routinely for any laceration or burn to those who have been actively immunized previously. The use of tetanus antitoxin for those who have not been previously immunized should be followed by the administration of a course of tetanus toxoid about one month after the injury.

The average cost of the care of a case of tetanus is approximately \$2,000. The cost of the 25 cases reported to have occurred in Kansas from 1951-1955 would have purchased 2,500,000 immunizing doses of diphtheria-pertussis-tetanus toxoid—more than enough to give every person in the state an injection.

The reporting of tetanus is probably poor. From the mortality observed, it would seem likely that the state averages at least 10 cases per year.

In the 11 deaths which occurred, the total reduction in life expectancy was estimated at 427 years.

Let's do something about preventable diseases. Let's prevent them!—*Philip A. Bearg, M.D., State Epidemiologist, Kansas State Board of Health.*

Life Insurance

Among the services a medical society may bring to its membership is the advantage of group purchasing. For that reason the Kansas Medical Society has several times made health and accident benefits available.

Now an agreement has been reached with the American United Life Insurance Company of Indianapolis for a special purchase on life insurance. The Kansas agent is Mr. Otto Schnellbacher of

Topeka. The plan was developed after years of exploration by your Committee on Medical Economics and approval by the House of Delegates.

The object is to give each member the chance to purchase a small amount of low cost life insurance without presenting evidence of insurability. This can now be done if 60 per cent of the eligible members enroll.

This is term insurance expiring at age 70. It accumulates no loan value and may or may not pay dividends according to the experience of this group. Dividends, if any, will be small, and your Society is asking that these be assigned to the Kansas Medical Society for whatever use the House of Delegates may select. Some suggested possibilities are a building fund, gift to A.M.E.F., or a reduction of dues.

The program is not meant to replace any existing insurance but to serve as a low cost supplement to whatever else may be in force. The cost is \$100 a year. The face value decreases annually to age 70, but it may be converted (without proof of physical fitness) at any time to age 65 for any other type of insurance. The face value is surprisingly large as shown on the announcement already received. It appears to your committee to be larger than could be privately purchased for an equal premium.

The policy is an individual non-cancellable policy that may be retained to its maturity or converted into other insurance if desired. To be eligible a doctor must belong to the Kansas Medical Society and be in active practice as of the day the program goes into effect. Beyond that, active practice or Society membership is not required. The policy cannot be cancelled by the company except for non-payment of premiums until the insured reaches age 70.

This life insurance project is more truly a program of the Society than are the other insurance programs in which the Society is interested because the Society will do the bookkeeping and collect the premiums. Upon the advice of the attorney for this Society and that of a tax attorney, this activity will not disturb the present tax status.

Enrollments are now being received. Participation is of course voluntary. It is hoped the project is attractive enough that each member will wish to enroll. Whenever 60 per cent of the eligible membership participates, the plan goes into effect. It is hoped this may be at an early date.

Sales of Series E and Series H Savings Bonds in Kansas in the first quarter of 1956 totaled \$34,075,219. Those sales produced 35.9 per cent of the 1956 goal for Kansas, \$94,900,000.



The story of curare being originally used as an arrow poison is well known—told often in connection with its more modern and more friendly use as a relaxing agent for medical purposes.

Less well known but also interesting are other types of arrow poisons and missiles on which they are used. The Jivaros Indians in South America have, since the 17th century, used poisoned darts and blowguns. Their use of the blowgun is exclusively in hunting and never in warfare; having been given to them for the purpose of obtaining game, to use it against man would bring bad luck!

"Short" blowguns are about 10 feet in length, longer ones as much as 15 feet. The longer ones are used for larger game, since they have longer range and greater accuracy, but carrying such a weapon through thick forest would present additional problems.

The manufacture of a blowgun is a painstaking process that cannot but excite the admiration of any "do-it-yourself" addict.

"When a man desires to make himself a blowgun, he first cuts down a suitable chonta palm which is allowed to dry in the sun for a week. . . . The thorns are removed . . . and [the trunk] is split in half. . . . Two strips, each about three inches in width, are split off and cut to the length desired. . . . With a machete these strips are shaved until they are straight and taper from one end to the other. One side of each is made flat while the other is rounded in such a fashion that when the two flat sides are placed together the two strips form a cylinder which tapers from about $1\frac{1}{4}$ inches in diameter at one end to three-quarters of an inch at the other.

"A perfectly straight cylindrical rod of chonta wood is prepared, approximately a quarter of an inch in diameter and slightly longer than the blowgun. A small, straight groove is scratched with a bone awl down the full length of each strip in the center of the flat side . . . using a sharp tooth [probably not his own—Ed.]. This groove is enlarged . . . until the two together are slightly less in diameter than the intended bore of the blow-

gun. The two halves are then placed face to face with the rod sandwiched between . . . and tied together with bark strips.

"Sand and water are then poured into the hollow. . . . The rod is worked back and forth . . . until the flat surfaces of the two chonta strips meet. . . . The bore is then of the size desired."

A glue is made, fastening the two halves together. Then they are wrapped spirally and covered with a coating of "charora," giving it a glossy surface.

". . . The large end of the blowgun for a length of two inches is dressed down until a small cylinder projects which is slightly larger than the bore. A bone mouthpiece is fitted snugly over this. . . . Another small lump of charora in the form of a small mound is applied to the barrel about a foot from the mouthpiece. The two incisor teeth of a watusa are then imbedded in this . . . as the blowgun sight.

"Finally the bore is polished by drawing the blowgun back and forth over a rattan strip to which a wad of cotton or balsa floss is attached . . . and the blowgun is ready for use.

"In using the blowgun it is held with both hands, palms down, close to the mouth, with the sight held uppermost. The bone mouthpiece is placed to the lips and a slight puff is sufficient to speed the dart on its way. . . . The maximum effective range of an average blowgun is about 45 yards. . . .

"Darts are made from the midribs of the ivory nut palm . . . cut into the proper length, which is measured from the base of the palm of the hand to the crook of the elbow . . . have a diameter equal to that of a common match. . . . Poison is necessary to make the darts effective, except when shooting small birds. . . . A circular cut [is made] around the dart about an inch from the point so that this section will break off in the wound."

Perhaps this information will be available in time that local nimrods can hunt quail and pheasant with blowguns this fall!—O.R.C. (*Ciba Symposia*, October, 1941)

Tumor Conference

Islet Cell Tumors

Edited by **FRANK Q. WINGFIELD, M.D.**

Dr. Stowell: These two patients present unusual tumors which are of especial interest because of their symptomatology and clinical and laboratory diagnosis. The first case is that of a benign functioning islet cell tumor causing classical symptoms. The second, however, is malignant and non-functional, and the possibility of a diagnosis of carcinoid instead of islet cell tumor must be seriously considered.

Mr. Lynch (medical student): The chief complaints of this 76-year-old colored man (J. H.) were spells of irrational behavior and weakness. Except for a diagnosis of hypertension made 13 years prior to this admission, he had been in good health for almost 49 years. About 15 months prior to admission he had finished work and was changing his clothes when he had an attack characterized by flailing movements of the extremities, profuse sweating, and irrational behavior, but no convulsions. He had two to three similar attacks a month for almost a year and then began to have about one attack per day. There were remissions lasting up to one week, however.

He was hospitalized 14 months prior to this admission, and at that time the physical and laboratory examinations revealed nothing diagnostic. He was discharged on a high protein, high fat, low carbohydrate diet. He soon discovered that he was unable to maintain this diet and began to drink orange juice or eat candy whenever one of these attacks appeared to be coming on. This quickly relieved the attacks. He subsequently gained 37 pounds in one year.

He was seen again one month prior to this present admission, at which time abdominal distention had occurred, and the examiner believed that he felt a large cystic mass almost 15 cm. in diameter in the upper mid-epigastrium. He was then readmitted to the hospital. At the time of his admission, his blood pressure was 180/90. He was an obese colored man who appeared in good health, and the only positive findings were a grade 2 arteriosclerotic retinopathy and an ill-defined 15 cm. mass in his epigastrium which was not movable, not hard, and not fluctuant. It was considered to be either a pancreatic cyst or, more probably, abdominal fat.

Other blood findings including serum lipase and serum amylase were normal. A glucose-tolerance test

showed a curve characterized by a low fasting blood sugar of 52 mgm. per cent, a moderate elevation the first hour, a leveling off at 70 to 80 mgm. per cent, and a final reading on a sixth specimen of 32 mg. per cent. This was considered diagnostic of a functioning pancreatic islet cell tumor or diffuse hyperinsulinism, but not of a reactive type hyperinsulinism since his fasting blood glucose was low. Abdominal, chest, and kidney-ureter-bladder x-ray films were negative.

On his seventh hospital day a tumor, which shelled out easily, was removed from the junction of the body and tail of the pancreas. The blood sugar on the day following operation was 260 mg. per cent. The second post-operative day he developed a high pulse rate and rapid respirations. His blood sugar continued to be elevated and on his third post-operative day was 380 mg. per cent. He was maintained on regular insulin therapy, 50 units on the second post-operative day; 40 units on the third post-operative day; and 20 units on the fourth post-operative day. His urine showed 3 to 4 plus sugar

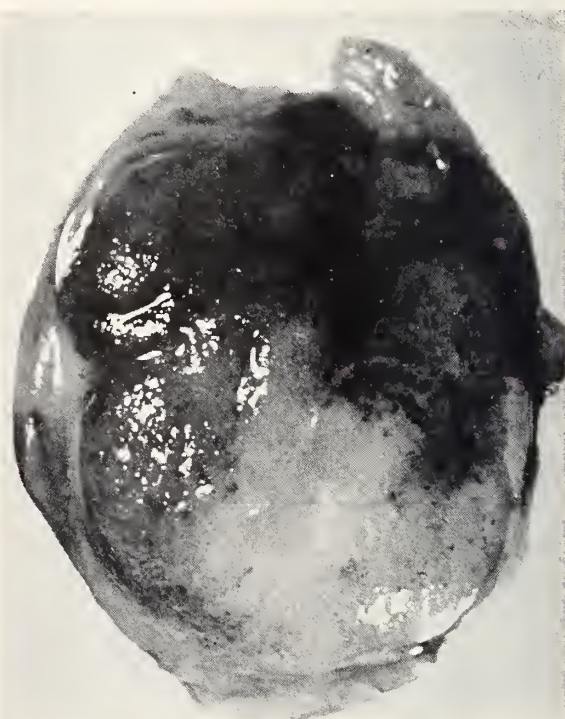


Figure 1. External view of islet cell tumor of the pancreas in first case.

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Wingfield is a Trainee of the National Cancer Institute.

during this time. The patient's blood glucose then became stabilized on his seventh post-operative day, and insulin therapy was discontinued. His blood sugar then was 173 mgm. per cent.

Dr. Boley: The surgical specimen consisted of a 2 cm. lobulated mass. At one pole there was a grayish-brown, moderately firm, encapsulated nodule measuring 1 cm. in diameter (Figure 1). Microscopic examination shows that there is compression and atrophy of the pancreas surrounding the tumor. The tumor cells are a little larger than the typical cells in the islets of Langerhans in the pancreas. There is little variation in the cells.

In some areas the tumor does not appear to be well encapsulated (Figure 2), which is regarded by some

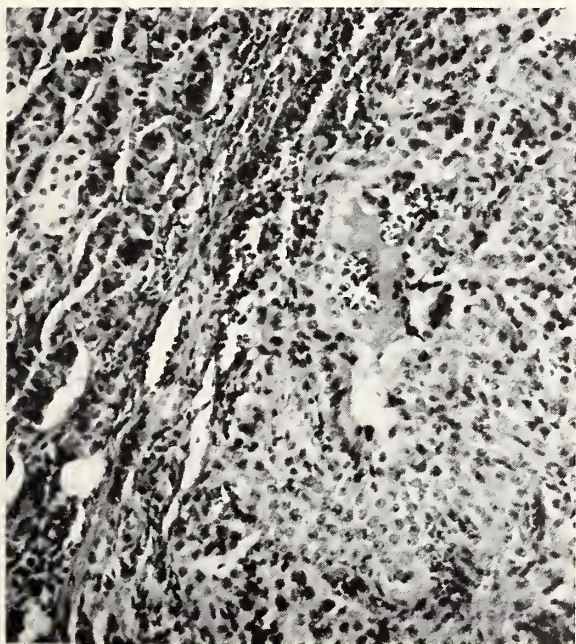


Figure 2. Islet cell tumor on right is poorly encapsulated from pancreas on left in first case. X 175

as an indication of malignancy. Franz reviewed the literature in 1940 and reported 96 cases, four of which actually showed malignant change.¹ With two other cases recently described, this makes a total of six reported functioning islet cell tumors with liver and lymph node metastases.² The microscopic diagnosis in this case is a benign islet cell tumor of the pancreas.

Dr. Robinson: Is this post-operative elevation of blood sugar an expression of the suppression of the normal insulin from the remainder of the pancreas because of the excessive secretion of the tumor?

Dr. Leo: Yes, that is probably the cause. One must also consider the effects of surgical trauma to the pancreas. Multiple islet cell tumors occur in about 15

per cent of cases, so we had to visualize the entire pancreas, palpate it on both surfaces, and reflect it upward and laterally to palpate the posterior surface. Therefore, pancreatic edema may also be a factor.

Dr. Stowell: The first case was one that could be diagnosed by clinical laboratory tests and confirmed by the pathologist. The second case presented a much more difficult problem for both the clinician and pathologist and simulates in some respects the carcinoid syndrome.

Miss Kells (medical student): This patient (E. W.) is a 46-year-old white woman who was first admitted to the hospital with the chief complaint of episodes of nausea and vomiting, intermittent diarrhea, and an enlarged liver.

Nine years prior to admission the patient had an appendectomy for acute appendicitis. Since that time she has had episodes of nausea and vomiting three or four times a year, in which she vomited clear fluid. She had always had trouble with constipation until two years ago when she began to have diarrhea which was characterized by one loose, watery brown stool occurring each day before breakfast.

Seven months prior to this admission she was hospitalized for one month because of nausea and vomiting. At that time a diagnosis of duodenal ulcer was made, and she was put on a bland diet and given antiacids and antispasmodics for six weeks, which relieved her symptoms. The etiology of the diarrhea was unexplained. During the past six months the diarrhea increased to five or six loose movements per day, some of which were foamy and contained undigested food particles. She was again hospitalized, two months prior to this admission, for nausea, vomiting, and diarrhea, and at that time x-rays of the kidneys, colon, and stomach were normal. She was treated with anti-amoebic medications although no amoebae were found in the stools.

Three weeks prior to her present admission, in addition to nausea, vomiting, malaise, and fatigue, she complained of cramping abdominal pain in the left upper quadrant which at times seemed to be related to her diarrhea and at other times did not. The pain shifted to the lower abdominal quadrants, back again to the left upper quadrant, and then disappeared. Her physician suggested that she be hospitalized.

She gave no history of jaundice, melena, hematemesia, anorexia, or food intolerance. She had lost five pounds in the last six months. She does not drink alcohol and has not been exposed to any hepatotoxic agents. She has been taking estrogen therapy for hot flashes and other menopausal symptoms without relief.

Physical examination revealed a well developed rather thin lady who was not jaundiced. The positive physical findings were palmar erythema and

an enlarged nodular tender liver extending four finger breadths below the costal margin and over which a bruit could be heard. The ovaries were palpated and felt to be enlarged and cystic.

Blood findings were essentially normal. The urinalyses showed faint traces of albumin and on one occasion 15 to 20 red blood cells per high power field. The serum chlorides were decreased to 90 mEq/L. A gastric analysis showed a fasting free acid of 114° and an acid of 130° at three hours. The glucose tolerance test was normal. There was no glycosuria except at the third hour when there was a trace. The urinary urobilinogen was slightly increased. The stools were negative for ova and parasites. They were tested for occult blood four times, and on one occasion a faint trace of blood was found. The serum amylase was elevated to 312 units, and the serum lipase was elevated to 2.5 units. Liver function tests were normal.

The chest plate showed emphysema and moderate fibrosis of the lungs. X-rays of the urinary tract and the gallbladder were considered negative. The upper gastrointestinal films showed considerable fluid in the stomach, pylorospasm, and narrowing of the duodenal bulb and, although there was no ulcer crater visualized, a diagnosis of duodenal ulcer was made. A barium enema showed a smooth filling defect in the sigmoid colon. A sigmoidoscopic examination was negative. An electrocardiogram showed a grade I block at the atrioventricular node. An exploratory laparotomy was performed on the 14th hospital day.

Dr. Stowell: Why was the operation done?

Miss Kells: There were many doctors who saw this patient, and there were quite a few diagnoses. The diagnoses considered by the surgeons were hemangioma of the liver, endometriosis, or metastases to the liver from a carcinoma of the colon. The internists thought that she had cirrhosis of the liver.

Dr. Hardin: What was the character of the bruit?

Dr. Leo: A systolic bruit heard just over the liver.

Dr. Hardin: Is she still having menstrual periods?

Miss Kells: Yes. The gynecologic consultant reported enlarged cystic ovaries.

Dr. Stowell: Dr. Leo, would you describe the gross findings at operation?

Dr. Leo: We found multiple metastases throughout both lobes of the liver which were rather soft, smooth, and did not have the characteristic yellow necrotic appearance usually associated with a metastatic adenocarcinoma. The nodules were of different sizes, the largest of which was approximately 4 cm. There was a large mass in the body of the pancreas measuring approximately 6 cm. in size. I am surprised that we could palpate it preoperatively. The other viscera were essentially normal except for bilateral cystic

ovaries, one of which we removed. The liver did not appear cirrhotic.

Dr. Hardin: What was the source of the bruit?

Dr. Leo: It was deep in the retroperitoneal space and probably due to tumor encroaching on the celiac artery.

Dr. Stowell: Dr. Boley, will you describe the findings on examination of the surgical specimens?

Dr. Boley: There were several cysts in the ovary which were filled with thick black fluid and lined by endometrial stroma and epithelium. Therefore, one diagnosis is endometriosis of the ovary.

The tumor in the liver, instead of being friable like adenocarcinoma of the bowel, was rather rubbery due to the abundant fibrous tissue. The tumor consists of nests of cells with surrounding fibrous stroma (Figure 3). The cells are rather uniform but still show enough variation to make one think that they are malignant. This is interpreted as metastatic tumor since the finding of a uniform type of primary sclerosing carcinoma in a non-cirrhotic liver would be most unusual.

There are two tumors that we must consider. One is that this is a carcinoid from the appendix or the ileum. The slides of the previously removed appendix are not available for study. A carcinoid of the ileum could be overlooked by palpation. Carcinoid tumors metastasize to the pancreas and also may originate there.³ The other possibility is that this is an islet cell tumor of the pancreas, especially since they found a

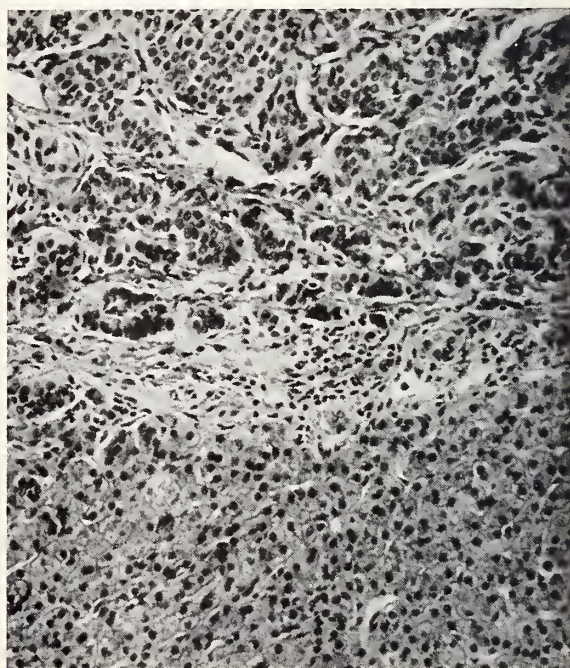


Figure 3. Metastatic tumor (above) in liver from second case. X 175

fairly large tumor in the pancreas. In some places the nests of cells form partial rosettes. A small percentage of islet cell tumors have been shown to form true rosettes,¹ but so do some carcinoid tumors.³ A somewhat similar pattern is seen in granulosa cell tumor of the ovary and neuroblastoma. The enlarged ovary was examined, and the other ovary was normal in size. She had no evidence of a neuroblastoma. On the evidence presented, I considered this a malignant islet cell tumor of the pancreas.

The argentaffin cells of the mucosa of the intestinal tract, which have silver staining granules, have been identified as the source of a hormone known as serotonin. Carcinoid tumors are composed of these cells, and large carcinoid tumors with metastases have been shown to produce a high level of this material in the blood.⁴ Serotonin is normally metabolized in the liver, and in patients with extensive liver metastases the level is especially high.⁴ Thus, the blood serotonin concentration is altered by the number and functional activity of cells producing serotonin and by the rate of its destruction in the liver. The cells in this tumor did not have positive staining granules. Malignant carcinoid tumors without silver staining granules do occur, however.⁵ Despite the negative stain the finding of a high level of 5-hydroxy-3-indoleacetic acid, which is the breakdown product of serotonin, in the urine would change the diagnosis to malignant carcinoid.⁴ How much actual exploration of the gastrointestinal tract was done to rule out the possibility of a carcinoid, and was the urine test done?

Dr. Leo: We checked the colon and small bowel carefully and they revealed no evidence of tumor. The urinary 5-hydroxy-3-indoleacetic acid was 4 gms/24 hours. (Normal 2-8 gms/24 hours.)*

Dr. Hardin: Dr. Klotz, what do you think about the high gastric acidity in relation to an islet cell tumor?

Dr. Klotz: I think that we see the type of gastric acid pattern obtained in this patient too frequently in otherwise normal individuals to put much emphasis on it in this particular instance. In cases with hypoglycemia, which was not clinically demonstrated in this woman, the production of acid gastric juice may be greatly increased. In some instances of marked and prolonged hypoglycemia, due to any cause, there may be a generalized increase in gastric acidity.

Dr. Stowell: Can you explain her presenting complaints on the basis of an islet cell or malignant carcinoid tumor?

Dr. Klotz: I don't think so. It is possible that steatorrhea could have accounted for her diarrhea. If this was not steatorrhea and there was no invasion of

the gastrointestinal tract, we can diagnose only a functional diarrhea which may have been influenced by her primary illness.

I have seen cases of pancreatic carcinoma in which pain was present for a while, disappeared, and then returned. I have not seen it with a pattern similar to the one seen in this case.

One significant laboratory finding that might have been given a little more attention is the elevated lipase.

Dr. Boley: Could this tumor have destroyed enough of the pancreas to cause steatorrhea?

Dr. Klotz: I don't think so from the description of what was found at operation. Using acute pancreatitis or chronic relapsing pancreatitis as a basis for comparison, a great deal of damage must occur to the pancreas before steatorrhea will appear. There can be a brief period of functional steatorrhea accompanying mild acute pancreatitis, but this usually clears up in a few days and the stools become normal again as far as the quantity of fecal fat is concerned. The pancreas, like the liver, has considerable reserve.

In some patients with carcinoid tumors of the gastrointestinal tract associated with increased levels of circulating serotonin, a bizarre clinical history has resulted that has been difficult to interpret. These patients have episodes of bronchoconstriction, flushing and palpitation, a cyanotic hue to the skin during an attack, diarrhea, and telangiectasis of the face and neck. Massage over the carcinoid or over metastases in the liver may precipitate one of these attacks.^{4, 5} In some cases they also develop pulmonic and tricuspid valvular lesions and arthritic symptoms.⁴ These symptoms can now be explained by the increased level of serotonin in the blood. Serotonin is normally found in the serum bound to the platelets and is considered to be important in the blood clotting mechanism.⁸ It also has been shown by its effect on smooth muscle to cause increased motility of the gastrointestinal tract,⁹ bronchoconstriction⁴ and vasodilatation.⁴

Dr. Stowell: Dr. Mantz, does the absence of elevated urinary 5-hydroxy-3-indoleacetic acid rule out carcinoid in this case, or can carcinoids be non-functioning?

Dr. Mantz: The normal finding⁶ in this case makes it seem unlikely that the patient's chronic diarrhea is on the basis of carcinoid tumor. It has been shown that the majority of nonargentophilic carcinoids do not elaborate serotonin, whereas ones with silver-positive granules frequently do.⁵ While the absence of elevated serotonin breakdown products in the urine does not exclude carcinoid tumor involving the liver in this case, it is ancillary evidence favoring a pancreatic islet cell origin of the lesion.

Dr. Stowell: These cases seemingly represent two

* Grateful acknowledgment is made to Dr. E. M. Speeter of Upjohn Company for samples of serotonin and 5-hydroxy-3-indoleacetic acid.

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The prevention and control of cellulitis, abscess formation, and generalized sepsis has become commonplace technique in surgery since ACHROMYCIN has been available. Leading investigators have documented such findings in the literature.

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¹Albertson, H.A. and Trout, H. H., Jr.: *Antibiotics Annual* 1954-55, Medical Encyclopedia, Inc., New York, N.Y., 1955, pp. 599-602.

²Prigot, A.; Whitaker, J. C.; Shidlovsky, B. A., and Marmell, M.: *ibid*, pp. 603-607.



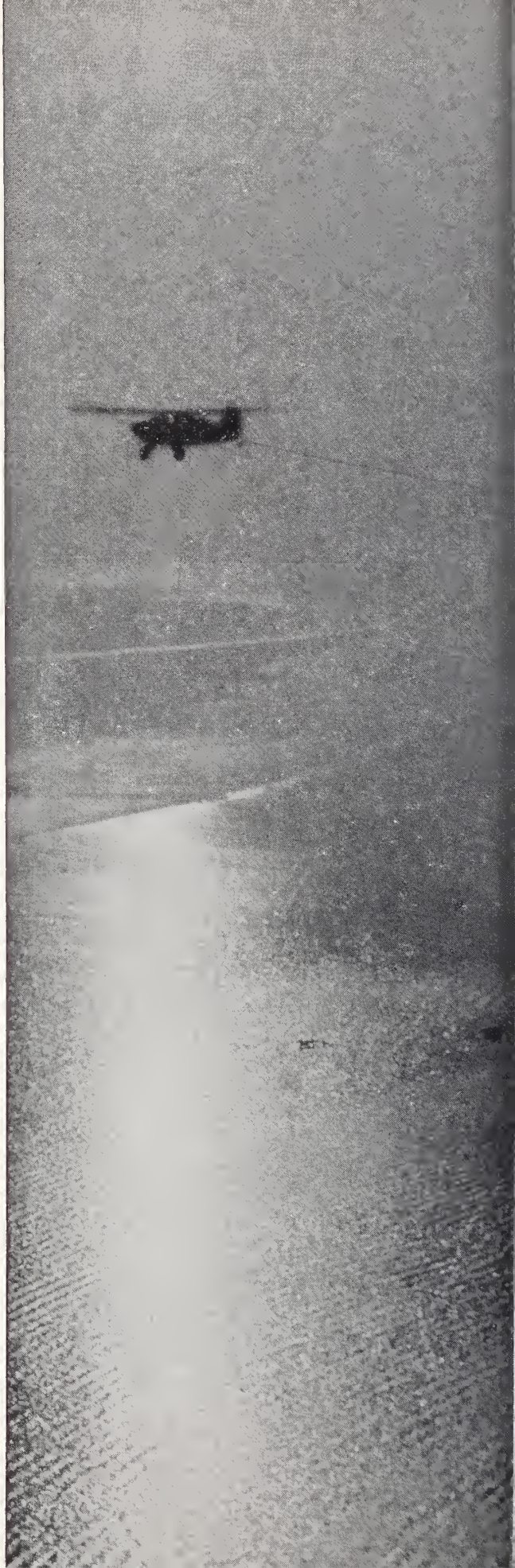
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ACHROMYCIN ACHROMYCIN

interesting examples of islet cell tumors, one functional and benign and one non-functional and malignant. I think the second case is of special interest. In this patient with substantial metastasis to the liver, we are not able to relate this rather extensive carcinoma directly to the gastrointestinal symptoms that brought the patient into the hospital.

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PHYSICIANS' ACTIVITIES

Dr. Edward X. Crowley, Wichita, was guest speaker at a recent meeting of the Sedgwick County Medical Assistants' Society. His subject was cancer.

Governor Fred Hall recently appointed two physicians to the Kansas State Board of Medical Registration and Examination, **Dr. Harvey L. Bogan** of Baxter Springs and **Dr. Frederick E. Wrightman** of Sabetha.

Dr. A. A. Fink, Topeka, was one of the speakers at a recent convention of the Kansas Society of Medical Technologists in Topeka.

A community dinner at Goodland last month gave honor to **Dr. Marion J. Renner**, a physician there for 30 years. The Registered Nurses Club of Goodland sponsored the event. **Dr. Arthur C. Gulick**, **Dr. H. M. Steever**, and **Dr. Dale D. Vermillion** took part in the program.

Dr. Leonard R. Diehl, who has been practicing in Osborne for three years, has moved to Oklahoma City.

A memorial honoring the late **Dr. Charles H. Lerrigo**, Topeka, is being established by the Kansas Tuberculosis and Health Association. The memorial will be the Lerrigo Research Laboratory at the University of Kansas Medical Center.

Dr. Phillip W. Russell, Wichita, has been awarded the Brower Traveling Scholarship of the American College of Physicians for 1956. He will work on hormone research at the Mayo Clinic.

Dr. Marion A. Throckmorton, formerly of the Hertzler Clinic, Halstead, is now practicing in Wichita.

The American College of Physicians announces that **Dr. Henry B. Stryker, Jr.**, Concordia, was accepted as an associate at the College's recent meeting in California.

Dr. William J. Reals, Wichita, was guest lecturer at a postgraduate assembly held recently at Creighton University Medical School, Omaha. He spoke on "Thyroid Tumors and Protein Bound Iodine Determinations."

Dr. Jack M. Catlett, Emporia, was Medical Education Week speaker in his home community. He explained to students of the Emporia schools the requirements for entering medical school, outlined the curriculum, and told of the preceptorship program at the University of Kansas School of Medicine.

A physician who left Ellinwood recently to serve with the Air Force, **Dr. James G. Gaume**, is now engaged in experiments in the field of space medicine. A series of articles in the *Houston Chronicle* recently told of tests in which Dr. Gaume is participating.

In observance of Medical Education Week, **Dr. Ernest W. Crow**, Wichita, addressed the Wichita Exchange Club on that subject.

Dr. A. E. Hiebert, Wichita, attended President Eisenhower's Conference on Occupational Safety in Washington, May 14-16.

Health officers recently appointed by their respective county boards of commissioners include the fol-

lowing: **Dr. Vale Page**, Plainville, Rooks County; **Dr. Chester M. Nelson**, Oberlin, Decatur County; **Dr. Lyle G. Glenn**, Protection, Comanche County; **Dr. Andrew M. Shelton**, Jetmore, and **Dr. Emery T. Gertson**, Atwood, Hodgeman County.

Dr. Carl C. Gunter and **Dr. Herman W. Hieserman**, Quinter, took part in a television program over KMBC-TV on April 22. **Dr. Franklin D. Murphy**, chancellor of the University of Kansas, moderated the panel discussion on rural health.

The Southern Society of Anesthesiologists, meeting recently in Augusta, Georgia, re-elected **Dr. Ray T. Parmley**, Wichita, secretary-treasurer of the organization.

Dr. Roy R. Shoaf, Lawrence, will go to Chicago late this month to begin a three-year residency in obstetrics and gynecology at the Illinois University Medical School and the Cook County Hospital.

Dr. J. P. Berger, **Dr. William J. Reals**, **Dr. Russell A. Nelson**, and **Dr. Thomas Fender**, Wichita, participated in a panel discussion on the need for more doctors over station KAKE-TV on April 17. The program was sponsored by Wichita University.

The Topeka Rotary Club's Man of the Month award was given in May to **Dr. Homer L. Hiebert** for his community service in nurturing the idea of Topeka's first science fair.

Members of the Rice County Medical Assistants' Society were guests of **Dr. R. E. Bula**, Lyons, at a dinner meeting last month.

Dr. Monti L. Belot, Jr., Lawrence, addressed the May meeting of the Douglas County Medical Assistants' Society on the subject of "Heart Sounds."

Dr. Ralph I. Canuteson, Lawrence, was re-elected president of the Kansas Tuberculosis and Health Association at the organization's annual meeting. **Dr. F. A. Trump**, Ottawa, was named to serve again on the board of directors.

Dr. Leslie E. Knapp, Wichita, was guest speaker at a meeting of the Kay-Noble Medical Society at

Blackwell, Oklahoma, recently. His topic was "Acute Appendicitis and Some of Its Complications."

The story of medical progress during the past 50 years was told to the Wichita Kiwanis Club last month by **Dr. Vernon E. Wilson**, assistant dean at the University of Kansas School of Medicine.

Dr. D. Cramer Reed, Wichita, was guest speaker at a recent meeting of the Downtown Optimist Club in Wichita. His subject was medical education and the supply of physicians.

DEATH NOTICES

ESTELLA EDWARDS CONOVER, M.D.

Dr. E. E. Conover, 74, who retired from practice in Cedar Vale in 1949 because of poor health, died at a hospital in Bethesda, Maryland, on April 28. She lived in Winfield after her retirement and was an honorary member of the Cowley County Medical Society. After her graduation from Bennett Medical College, Chicago, in 1910, she practiced in association with her husband, **Dr. Robert S. Edwards**, until his death in 1944. She was married to **J. A. Conover** in 1953 and since then had lived in Maryland.

JAMES BRANSON WEAVER, M.D.

Dr. J. B. Weaver, 58, head of the Department of Orthopedics at the University of Kansas School of Medicine, died on April 30. He was an active member of the Johnson County Medical Society.

Dr. Weaver was graduated from the University of Kansas School of Medicine in 1925, served his internship in New York, and did postgraduate work in Liverpool and Vienna. In 1927 he became a member of the faculty at the Kansas school. During World War II he was surgical chief of the 77th Evacuation Hospital Unit, and he was awarded the Legion of Merit for his service in England, Africa, France, Sicily, Belgium, and Germany.

For 30 years he had worked with the Kansas Crippled Children Commission, and for three years he had served on its board. He was a diplomate of the American Board of Orthopedic Surgery, a member of the Clinical Orthopedic Society, and a member of the American Academy of Orthopedic Surgeons.

Committees for 1956-1957

ALLIED GROUPS

C. R. Rombold, Wichita, Chairman; J. J. Basham, Fort Scott; C. H. Benage, Pittsburg; H. O. Bullock, Independence; W. M. Cole, Wellington; R. D. Dickson, Topeka; F. B. Emery, Concordia; J. H. Holt, Wichita; H. F. Janzen, Hillsboro; G. D. Marshall, Colby; J. Neuschwander, Hoxie; R. H. O'Donnell, Ellsworth; R. E. Stowell, Kansas City; S. L. Vander Velde, Emporia.

ANESTHESIOLOGY

M. M. Tinterow, Wichita, Chairman; H. H. Hyndman, Wichita; P. H. Lorhan, Kansas City; W. O. Martin, Topeka; L. W. Owen, Wichita; W. Stephenson, Norton; E. M. Sutton, Salina.

AUXILIARY

C. O. West, Kansas City, Chairman; W. J. Biermann, Wichita; C. V. Black, Pratt; E. M. Harms, Wichita; B. A. Nelson, Manhattan; R. E. Pfuetze, Topeka; C. E. Stevenson, Neodesha; I. J. Waxse, Oswego.

BLUE SHIELD FEE SCHEDULE

A. G. Isaac, Newton, Chairman, Urology; W. L. Beller, Topeka, Radiology; H. J. Brown, Winfield, Anesthesiology; D. R. Davis, Emporia, Pediatrics; K. L. Druet, Salina, Internal Medicine; T. L. Foster, Halstead, Psychiatry; N. L. Francis, Wichita, ENT; W. H. Fritze-meier, Wichita, Dermatology; J. E. Hill, Arkansas City, Ophthalmology; G. B. Joyce, Topeka, Orthopedics; J. G. Kendrick, Wichita, Obstetrics and Gynecology; R. G. Klein, Dodge City, General Surgery; W. R. Lentz, Seneca, General Practice; C. A. Newman, Topeka, General Practice; W. J. Reals, Wichita, Pathology.

BLUE SHIELD RELATIONS

D. G. Laury, Ottawa, Chairman; A. W. Beahm, Great Bend; P. L. Beiderwell, Belleville; M. A. Brewer, Ulysses; E. W. Christmann, Wamego; J. H. Coffman, Oberlin; J. A. Dunagin, Topeka; W. A. Grosjean, Winfield; P. Irby, Fort Scott; J. L. McGovern, Wellington; J. H. McNickle, Ashland; J. L. Morgan, Emporia; R. T. Nichols, Hiawatha; W. J. Pettijohn, Russell; H. R. Schmidt, Newton; L. N. Speer, Kansas City; C. M. White, Wichita.

CENTENNIAL

T. P. Butcher, Emporia, Chairman; Shawnee County Chairman; E. W. Crow, Wichita; W. M. Mills, Topeka; B. A. Nelson, Manhattan; G. R. Peters, Kansas City; R. Sohlberg, Jr., McPherson; W. C. Wescoe, Kansas City.

CHILD WELFARE

D. R. Davis, Emporia, Chairman; W. H. Crouch, Topeka; W. P. Hibbett, McPherson; E. D. Hinshaw, Arkansas City; T. C. Hurst, Wichita; A. C. Irby, Fort Scott; H. P. Jubelt, Manhattan; W. F. McGuire, Wichita; O. L. Martin, Salina; L. N. Speer, Kansas City; H. J. Williams, Osage City.

CONSERVATION OF EYESIGHT

W. M. Scales, Hutchinson, Chairman; B. J. Ashley, Topeka; L. L. Calkins, Kansas City; M. A. Carter,

Wichita; J. E. Hill, Arkansas City; D. O. Howard, Wichita; M. S. Lake, Salina; D. T. Loy, Great Bend; H. E. Morgan, Newton; D. P. Trimble, Emporia; D. D. Vermillion, Goodland.

CONSERVATION OF HEARING AND SPEECH

R. Montgomery-Short, Halstead, Chairman; C. W. Armstrong, Salina; J. A. Budetti, Wichita; C. L. Gray, Wichita; E. E. Miller, Pittsburg; V. R. Moorman, Hutchinson; W. D. Pitman, Pratt; G. O. Proud, Kansas City; R. E. Riederer, Olathe.

CONSTITUTION AND RULES

A. W. Fegty, Wichita, Chairman; H. S. Bowman, Wichita; G. L. Thorpe, Wichita; H. B. Vallette, Beloit; C. E. Vestle, Humboldt.

CONTROL OF CANCER

D. C. Reed, Wichita, Chairman; J. P. Berger, Wichita; C. G. Bly, Kansas City; T. P. Butcher, Emporia; A. M. Cherner, Hays; J. C. Dysart, Sterling; A. A. Fink, Topeka; W. A. Grosjean, Winfield; H. L. Hiebert, Topeka; W. J. Kiser, Wichita; J. R. Kline, Wichita; C. H. Miller, Parsons; N. C. Nash, Wichita; R. H. Riedel, Topeka; L. E. Vin Zant, Wichita; H. M. Wiley, Garden City.

CONTROL OF TUBERCULOSIS

J. W. Spearing, Columbus, Chairman; A. L. Ashmore, Wichita; A. Baude, Topeka; J. A. Butin, Chanute; R. I. Canuteson, Lawrence; M. J. FitzPatrick, Kansas City; J. L. Morgan, Emporia; C. Pokorny, Halstead; C. F. Taylor, Norton; P. H. Wedin, Wichita.

EMERGENCY MEDICAL CARE

D. P. Trees, Wichita, Chairman; G. L. Ashley, Chanute; A. H. Bacon, Wichita; K. F. Bascom, Manhattan; F. C. Beelman, Topeka; R. M. Brooker, Topeka; L. F. Glaser, Hutchinson; A. E. Hiebert, Wichita; H. H. Hyndman, Wichita; G. E. Manahan, Lawrence; G. R. Peters, Kansas City; W. A. Smiley, Jr., Junction City; R. E. Speirs, Dodge City; J. F. Thurlow, Hays.

ENDOWMENT

C. V. Black, Pratt, Chairman; J. A. Howell, Wellington; D. C. McCarty, Medicine Lodge; R. A. Nelson, Wichita; J. W. Randell, Marysville.

EXECUTIVE

C. W. Miller, Wichita; B. A. Nelson, Manhattan; C. M. Barnes, Seneca; G. E. Burket, Jr., Kingman; J. L. Lattimore, Topeka.

GENERAL PRACTICE AWARD

G. L. Thorpe, Wichita, Chairman; C. M. Barnes, Seneca; C. W. Bowen, Topeka; L. G. Glenn, Protection; A. C. Harms, Kansas City; L. E. Leigh, Overland Park.

HISTORY

W. M. Mills, Topeka, Chairman; J. F. Barr, Ottawa; H. C. Clark, Wichita; R. R. Melton, Marion; C. C. Nesselrode, Kansas City; R. A. Schwegler, Lawrence; G. S. Voorhees, Leavenworth.

HOSPITAL SURVEY

R. W. Myers, Newton, Chairman; A. C. Armitage, Hutchinson; L. E. Beal, Fredonia; E. Beebe, Olathe; W. M. Campion, Liberal; P. S. Combs, Leavenworth; E. R. Gelvin, Concordia; E. T. Gertson, Atwood; G. F. Gsell, Wichita; H. S. O'Donnell, Ellsworth; A. J. Rettenmaier, Kansas City; A. E. Rueb, Salina; R. E. White, Garnett; J. K. Wisdom, Wichita.

INDUSTRIAL MEDICINE

W. L. Anderson, Atchison, Chairman; E. S. Brinton, Wichita; I. W. Cain, Kansas City; L. A. Donnell, Wichita; J. A. Grove, Newton; A. R. Mueller, Leavenworth; J. H. A. Peck, St. Francis; H. L. Regier, Kansas City; M. F. Russell, Great Bend; R. W. Urie, Parsons.

MATERNAL WELFARE

E. X. Crowley, Wichita, Chairman; L. E. Filkin, Concordia; H. M. Floersch, Kansas City; H. M. Foster, Hays; R. G. Heasty, Manhattan; R. L. Hermes, Lawrence; J. S. Menaker, Wichita; R. Sohlberg, Jr., McPherson; D. L. Tappen, Topeka.

MEDICAL ASSISTANTS

M. C. Eddy, Hays, Chairman; L. G. Allen, Jr., Kansas City; A. C. Armitage, Hutchinson; R. E. Bula, Lyons; W. P. Callahan, Sr., Wichita; K. J. Gleason, Independence; H. U. Kennedy, Topeka; F. E. Nyberg, Wichita; M. E. Schulz, Russell.

MEDICAL ECONOMICS

G. E. Kassebaum, El Dorado, Chairman; G. B. Athy, Columbus; A. H. Baum, Dodge City; J. N. Blank, Hutchinson; G. F. Corrigan, Wichita; O. W. Longwood, Stafford; M. B. Miller, Topeka; J. C. Mitchell, Salina; B. A. Nelson, Manhattan; L. S. Nelson, Jr., Salina; R. T. Parmley, Wichita; F. G. Schenck, Burlingame; C. H. Steele, Kansas City.

MEDICAL PRACTICE ACT

L. R. Pyle, Topeka, Chairman; J. D. Colt, Jr., Manhattan; N. L. Francis, Wichita; J. A. McClure, Topeka; N. E. Melencamp, Dodge City; C. W. Miller, Wichita; L. S. Nelson, Sr., Salina; L. F. Schmaus, Iola; Attorneys for the Society and for the Board.

MEDICAL SCHOOLS

R. W. Fernie, Hutchinson, Chairman; R. G. Ball, Manhattan; M. E. Christmann, Pratt; E. W. Crow, Wichita; O. W. Davidson, Kansas City; N. M. Jenkins, Salina; L. C. Joslin, Harper; D. Marchbanks, Hill City; B. P. Meeker, Wichita.

MENTAL HEALTH

W. F. Roth, Jr., Kansas City, Chairman; A. J. Adams, Wichita; H. V. Bair, Parsons; A. P. Bay, Topeka; O. R. Cram, Jr., Larned; J. A. Dunagin, Topeka; D. B. Foster, Topeka; T. L. Foster, Halstead; M. T. Glassen, Phillipsburg; E. D. Greenwood, Topeka; L. W. Hatton, Salina; T. R. Hood, Topeka; G. W. Jackson, Topeka; P. C. Laybourne, Jr., Kansas City; R. A. Moon, Prairie Village; R. F. Schneider, Kansas City; D. R. Wall, Wichita; E. M. Wright, Lawrence.

NECROLOGY

O. R. Clark, Topeka, Chairman; D. E. Gray, Topeka;

R. Greer, Topeka; D. Lawson, Topeka; J. A. Segerson, Topeka.

PATHOLOGY

B. E. Stofer, Wichita, Chairman; A. A. Fink, Topeka; T. R. Hamilton, Kansas City; C. A. Hellwig, Halstead; C. J. Weber, Salina.

POSTGRADUATE STUDY

E. L. Mills, Wichita, Chairman; W. H. Algie, Kansas City; G. E. Burket, Jr., Kingman; M. F. Delp, Kansas City; D. Lawson, Topeka.

PUBLIC POLICY

To meet at call of president. C. M. Barnes, Seneca; C. H. Benage, Pittsburg; W. F. Bernstorf, Winfield; W. P. Callahan, Sr., Wichita; O. W. Davidson, Kansas City; M. C. Eddy, Hays; E. S. Edgerton, Wichita; J. F. Gsell, Wichita; J. L. Lattimore, Topeka; F. L. Loveland, Topeka; N. E. Melencamp, Dodge City; W. M. Mills, Topeka; L. S. Nelson, Sr., Salina; C. C. Nesselrode, Kansas City; J. H. A. Peck, St. Francis; L. R. Pyle, Topeka; H. N. Tihen, Wichita, and Members of Executive Committee.

PUBLIC RELATIONS

D. E. Gray, Topeka, Chairman; A. L. Ashmore, Wichita; N. L. Francis, Wichita; C. C. Gunter, Quinter; J. D. McMillion, Coffeyville; J. W. Manley, Kansas City; V. R. Moorman, Hutchinson; E. Myers, Iola; J. G. Phipps, Wichita; C. O. Stensaas, Arkansas City; V. E. Wilson, Kansas City.

RURAL HEALTH

V. E. Brown, Sabetha, Chairman; H. L. Bogan, Baxter Springs; M. F. Frederick, Hugoton; R. E. Grene, La Crosse; H. W. Hiesterman, Quinter; F. Law, Bird City; R. M. Owensby, Mankato; L. W. Patzkowsky, Kiowa; E. B. Scagnelli, Dodge City; R. R. Snook, McLough; E. F. Steichen, Lenora; C. R. Svoboda, Chapman; M. H. Waldorf, Jr., Greensburg; T. L. Wayland, Nashville; H. O. Williams, Cheney; E. D. Yoder, Denton.

SCHOOL HEALTH

C. M. Barnes, Seneca, Chairman; W. F. Bernstorf, Winfield; J. A. Butin, Chanute; W. H. Crouch, Topeka; D. B. Foster, Topeka; E. D. Greenwood, Topeka; L. E. Haughey, Concordia; H. P. Jubelt, Manhattan; P. C. Laybourne, Kansas City; H. Lutz, Augusta; W. C. Menninger, Topeka; F. D. Murphy, Lawrence; R. R. Snook, McLough; L. N. Speer, Kansas City.

STORMONT MEDICAL LIBRARY

W. Mau, Topeka, Chairman; M. D. Morris, Topeka; N. V. Treger, Topeka.

STUDY OF HEART DISEASE

G. L. Norris, Winfield, Chairman; D. R. Bedford, Topeka; E. G. Dimond, Kansas City; C. W. Erickson, Pittsburg; L. H. Leger, Kansas City; P. W. Morgan, Emporia; L. O. E. Peckenschneider, Halstead; M. Snyder, Salina; D. C. Wakeman, Topeka; G. B. Wood, Wichita.

VENEREAL DISEASE

H. W. Lane, Kansas City, Chairman; M. L. Bauman, Wichita; A. B. Harrison, Wichita; C. H. Murphy, Topeka; L. C. Murphy, Wichita.

Official Proceedings, 97th Annual Session

The 97th annual session of the Kansas Medical Society, held at Topeka, April 29 through May 3, was attended by 600 physicians, 125 guests (hospital administrators, technicians, nurses, etc.), 198 members of the Woman's Auxiliary to the Kansas Medical Society, and 199 members of the Kansas Medical Assistants' Society.

The program followed the outline published in the April issue of the JOURNAL, and the scientific sessions were well attended and well received. The social highlight of the week was the annual banquet held at the Topeka Country Club with Dr. Conrad M. Barnes, Seneca, presiding. An entertaining program was presented, climaxed by the administration of the oath of office to Dr. Clyde W. Miller, Wichita, president of the Society for 1956-1957.

An award which had been kept secret until the time of the banquet was presented to Dr. A. W. Feghtly, Wichita, for his distinguished service to the Society. He was given a plaque bearing the following words: "In grateful acknowledgment for outstanding service in the practice of medicine and to the medical profession, the Kansas Medical Society proudly presents this award to Arthur W. Feghtly, M.D., May 2, 1956."

An award for the best scientific exhibit was given to Dr. Alfred M. Tocker, Wichita, for his presentation entitled "Cardiac Arrest." The second prize went to Dr. Karl A. Youngstrom, of the University of Kansas Medical Center, for an exhibit on "Cerebral Arteriography," and the third award was given to Dr. J. Walker Butin and Dr. Thomas J. Luellen, Wichita, for their exhibit, "Fluid and Electrolyte Balance in Postoperative Cases." Dr. Manuel Sklar of Chicago, Dr. William C. Keettel of Iowa City, and Dr. Samuel Zelman, Topeka, judged the scientific exhibits.

FIRST SESSION, HOUSE OF DELEGATES

The first meeting of the House of Delegates of the 1956 session was held on Tuesday evening, May 1, at the Hotel Jayhawk, Topeka. Dr. Conrad M. Barnes, Seneca, president, presided.

In reporting the presence of a quorum, Dr. A. W. Feghtly, Wichita, announced the attendance of 71 delegates, 7 officers, 17 councilors, and 8 past presidents.

Dr. Donald P. Trees, Wichita, presented summaries of the councilor and committee reports published in the April issue of the JOURNAL. Supplementary reports were given by Dr. Francis T. Collins, Topeka, for the Committee on Public Rela-

tions; Dr. Glen E. Kassebaum, El Dorado, for the Committee on Medical Economics; Dr. A. W. Feghtly, for the Committee on Constitution and Rules; Dr. C. V. Black, Pratt, for the Committee on Endowment; Mr. Oliver E. Ebel, Topeka, for the Committee on Hospital Survey and for the Committee on Medical Assistants; Dr. Lucien R. Pyle, Topeka, for the Committee on Health Legislation and Healing Arts Act.

The report of the Committee on Necrology was submitted by Dr. Clyde W. Miller, Wichita.

Dr. Lloyd W. Reynolds, Hays, representing Blue Shield, showed slides to illustrate a \$4,500 family income service plan and a \$6,000 plan and introduced resolutions of approval.

In the absence of Dr. William H. Algie, chairman of the Committee on Postgraduate Study, Dr. Barnes read a supplementary report for that group.

The Meade County Medical Society requested permission to separate from the Seward County Medical Society.

A resolution from the Marion County Medical Society, asking Blue Cross and Blue Shield participation in a plan to provide medical care for welfare clients, was introduced by Dr. Peter D. Ens, Hillsboro.

Dr. Orville R. Clark, editor of the JOURNAL, presented his annual report. He was given a bound copy of the issues published in 1955 in recognition of his services.

In his address as executive secretary, Mr. Oliver E. Ebel recommended participation in science fairs and health workshops as public relations projects for the Society. Mr. Rueben M. Dalbec, executive assistant, suggested formation of a committee on federal legislation and outlined a plan to educate school children on health matters by sponsorship of first aid projects and essay contests.

The constitutional secretary, Dr. James A. Butin, Chanute, reported total membership in the Society as 1,842. This includes 1,303 paid members, 183 honorary, 68 on leave of absence, 28 in service, and 260 delinquent in dues.

The auditor's report was the treasurer's report.

Dr. L. S. Nelson, Sr., Salina, and Dr. George F. Gsell, Wichita, delegates to the American Medical Association, gave reports. Additional information about the A.M.A. was presented by Dr. James R. McVay, Kansas City, Missouri, trustee for this district.

A guest, Dr. Dwight H. Murray of Napa, California, president-elect of the A.M.A., then addressed the meeting. He spoke on legislative efforts of the

IMPORTANT RESEARCH CONTRIBUTION

Searle Introduces:

A Practical New Steroid for Protein Anabolism

Nilevar*

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PROTEOGENIC EFFECTIVENESS • The newest Searle Research development, Nilevar, exerts a potent force in protein anabolism. Yet it is without appreciable androgenic effect (approximately one-sixteenth of that exerted by the androgens).

Investigations with Nilevar show that nitrogen, potassium and phosphorus are retained in ratios indicating protein anabolism. Nilevar is thus the first steroid which is primarily anabolic and which provides a practical means of meeting the numerous demands for protein synthesis.

NILEVAR IS ORALLY EFFECTIVE • Clinical response to Nilevar is characterized not only by protein anabolism but also by an increase in appetite and an improved sense of well-being.

SAFETY AND PRECAUTIONS • Nilevar has an extremely low toxicity. Laboratory animals fail to show toxic effects after six months of continuous administration of high dosages. Nilevar should not be administered to patients with prostatic carcinoma. Nausea or edema may be encountered infrequently.

DOSAGE • The daily *adult* dose is three to five Nilevar tablets (30 to 50 mg.) but up to 100 mg. may be administered. For *children* the daily dose is 1 to 1.5 mg. per kilogram of body weight. Individual dosages depend on need and response to therapy. Nilevar is available in 10 mg. tablets. G. D. Searle & Co., Research in the Service of Medicine.

INDICATIONS:

Nilevar is indicated in the vast area of surgical, traumatic and disease states in which protein anabolism is desirable for hastening recovery. The specific indications are:

1. Preparation for elective surgery.
2. Recovery from surgery.
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4. Recovery from severe trauma or burns.
5. Nutritional care in wasting diseases such as carcinoma, tuberculosis and tuberculosis.
6. Domiciliary care of decubitus ulcers.
7. Care of premature infants.



*Trademark of G. D. Searle & Co.

SEARLE

A.M.A. and the work of the Committee on Hospital Accreditation.

Dr. Barnes gave a brief presidential report. He announced also that Governor Fred Hall had notified him earlier of two appointments to the Kansas State Board of Medical Registration and Examination, Dr. Harvey L. Bogan of Baxter Springs and Dr. Frederick E. Wrightman of Sabetha.

The message of the president-elect, Dr. Clyde W. Miller, followed.

The meeting was then opened for introduction of items of new business. Dr. L. S. Nelson asked consent for immediate action on a matter of urgency, the sending of telegrams to senators and representatives in Washington in opposition to H.R. 7225. The consent was given and the telegrams were dispatched.

Dr. Ralph G. Ball, Manhattan, for the Riley County Medical Society, introduced a resolution recommending that the legislature of Kansas appropriate funds for construction of a new Student Health Center at Kansas State College.

A resolution changing the name of the Committee on Hospital Survey to the Committee on Survey and Accreditation of Hospitals was introduced by Dr. Barrett A. Nelson, Manhattan.

Dr. Francis X. Lenski, Jr., Iola, introduced a resolution regarding medical society politics.

Dr. Barnes reported that all items of business introduced would be considered on the following day by a reference committee and would be acted upon at a second House of Delegates meeting on Thursday. He asked Dr. Floyd C. Taggart of Topeka, Dr. Norton L. Francis, Wichita, and Dr. Lloyd W. Reynolds, Hays, to serve on the reference committee and announced the time and place of the committee meeting.

SECOND SESSION, HOUSE OF DELEGATES

Dr. Conrad M. Barnes, Seneca, president, called to order the second meeting of the House of Delegates for 1956 after a 12:30 luncheon at the Hotel Jayhawk, Topeka, on Thursday, May 3. The presence of a quorum was announced by Dr. A. W. Fegty, Wichita, who reported the attendance of 73 delegates, 7 officers, 14 councilors, and 7 past presidents.

Dr. Norton L. Francis, Wichita, gave the first portion of the report of the reference committee. The committee's recommendation that councilor reports be accepted as published in the JOURNAL was approved.

A resolution introduced by the Central Kansas Medical Society, recommended for adoption by the reference committee, was approved as follows:

Be it resolved that the Ellsworth County physi-

cians be transferred from their present assignment in District No. 9 to that of Councilor District No. 13, thereby including Ellsworth County in the same councilor district as Hays and Russell Counties.

The reference committee did not approve a resolution introduced by the Nemaha County Medical Society, providing for a change in the succession of officers in case of death of the president. The House of Delegates voted to make no change in this regard.

The request of the Meade County Medical Society to separate from Seward County was linked, in the reference committee report, with a recommendation that the Council study the condition of small county societies with a view toward combining some of these into multi-county societies, with new charters to be issued by the Council to each component group. The reference committee report was adopted.

A long discussion preceded action on a request from the Committee on Hospital Survey concerning public medical institutions. Although the reference committee recommended adoption of the request, the House voted to return the matter to the Committee on Hospital Survey for further study.

A proposal from the Committee on Medical Assistants, that an educational course of the circuit type be conducted during the coming year, was approved by the reference committee and by the House.

A standard insurance medical report form was discussed. A motion that the Kansas Medical Society should not buy copyrighted forms was approved, along with a recommendation that each individual physician should pay for his own insurance blanks.

The reference committee approved a project of the Committee on Medical Economics, and the House approved also. This provides for a life insurance program for members of the Society without proof of insurability if 60 per cent of the eligible members choose to participate. Under this plan, through the American United Life Insurance Company, the Society will receive 5 per cent of the premiums in exchange for taking care of collections.

Accepting the recommendation of the reference committee, the House approved a plan under which the Committee on Medical Economics will negotiate with insurance carriers for improved health and accident contracts.

A resolution introduced at the Tuesday meeting by the Marion County Medical Society was withdrawn in favor of a resolution submitted by the Committee on Medical Economics. Both covered the subject of medical care for the indigent. The reference committee recommended adoption of the resolution and the House concurred. The resolution follows:

WHEREAS, The Riley County Medical Society has

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for 20 years, and up to the present time, carried an insurance program for physician care only, and

WHEREAS, The Saline County Medical Society has within the past few weeks negotiated a contract for \$7.50 per person per month, in which hospitals, druggists, and physicians are paid on a percentage basis, and

WHEREAS, In spite of the above, the State Board of Social Welfare still insists that the maximum shall be \$6.50 per person per month, and that the contract must include hospital, drugs, and physicians' services, therefore be it

Resolved, That the entire matter of indigent health care be referred to each county medical society with the recommendation that negotiations be opened with county commissioners on a local basis. And, be it further

Resolved, That an effort be made to establish the contract on the basis that it shall cover physician care only, or, if it includes hospital and drug costs, that the three services shall be apportioned on a specific percentage for each.

Approval was given by the reference committee and by the House of Delegates to a suggestion of the Committee on Public Relations, that a copy of the Colorado Code of Cooperation between Medicine and News Agencies be sent to each component society in Kansas for study and adoption where it appears applicable.

A second suggestion of the Committee on Public Relations, regarding preparation of "an average fee schedule for the average conditions to the average patient," was not approved by the reference committee and was not adopted by the House.

The reference committee commended the Committee on Rural Health for its efforts to bring the National Rural Health Conference to Kansas in 1959 and recommended that the House of Delegates extend an invitation to the American Medical Association to hold the conference in Wichita in 1959. The recommendation was accepted by the House. Mr. Aubrey Gates, field secretary for the A.M.A. Council on Rural Health, a guest at the meeting, then expressed his hope that the invitation will be accepted.

The work of a special committee which has been studying the Kansas Medical Practice Act was approved by the reference committee and by the House.

Establishment by Blue Shield of a \$4,500 family income plan was recommended by the reference committee and approved by the House. Discussion of a \$6,000 family income plan was limited to whether or not such a plan is desired at this time. The House voted to omit consideration of such a program.

Dr. Floyd C. Taggart, chairman of the reference

committee, presented the remainder of the committee report. He stated that the committee approved the work of the editor of the JOURNAL, Dr. Orville R. Clark, and extended him a vote of thanks. The House of Delegates concurred.

A recommendation that the Kansas Medical Society and its component groups assist in the development of science fairs throughout the state was approved by the reference committee and by the House.

The establishment of an essay contest was next considered. The reference committee recommendation, that the matter be referred to the Committee on Public Relations, was approved.

In reporting on a suggestion that a committee be appointed to study legislation, the reference committee felt that the officers of the Society are now handling this responsibility in a satisfactory manner. The committee recommended that no change be made, and the House approved.

The reference committee and the House accepted the report of the constitutional secretary, adding an expression of gratitude to Dr. James A. Butin for his work.

After studying the auditor's report, the reference committee recommended that the balance now remaining in the Student Union Fund be sent to the American Medical Education Foundation, marked for the University of Kansas School of Medicine for use at the Student Union Building.

A recommendation of the reference committee that \$3,500 from the Graduate Education Fund be sent to the American Medical Education Foundation, marked for the University of Kansas School of Medicine for use in graduate education, was approved by the House of Delegates.

In approving the treasurer's report, the reference committee added an expression of thanks to Dr. John L. Lattimore for "this and the many other services he has been and is continually giving to this Society." The House applauded to express its approval.

A motion made by the chairman of the reference committee, that the supplementary report of the Committee on Endowment be accepted with commendation for Dr. C. V. Black's outstanding effort in behalf of A.M.E.F., was accepted by the House. Future solicitations for A.M.E.F. are to be conducted by the councilor of each district.

A rising vote of thanks was extended to Dr. Conrad M. Barnes, retiring president, and a vote of confidence and a pledge of assistance were given Dr. Clyde W. Miller, incoming president.

The reference committee agreed with the spirit of a resolution introduced by the Riley County Medical Society, concerning construction of a new health center at Kansas State College, but felt that action

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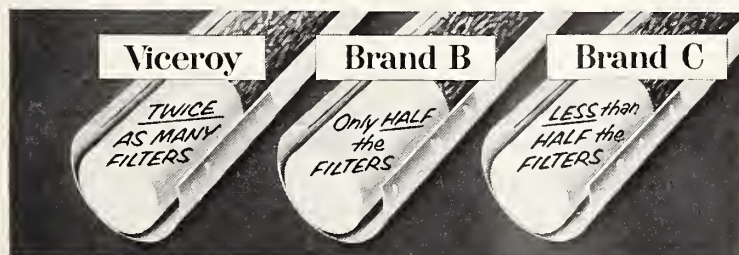
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many filters as the other two largest-selling filter brands. That is why Viceroy's are smoother by far—never, never rough. That is why so many doctors now smoke and recommend Viceroy's.

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of approval would be contrary to the policy of the Society. The committee recommended that individual members of the Society obtain the support of their legislators for this purpose, and the House voted approval.

A resolution introduced at the Tuesday meeting concerning accreditation of hospitals was not approved by the reference committee. That group recommended that the president assign this subject to a specific committee for study, and the House of Delegates approved.

While agreeing with the purpose of a resolution regarding medical society politics, the reference committee favored taking no action since the policy and practice of the Kansas Medical Society make it unnecessary. A motion to that effect carried.

Election of officers was next on the agenda. Those chosen by the House of Delegates are listed elsewhere in this issue.

A resolution of thanks to the Shawnee County Medical Society for its efforts in arranging the 1956 annual session was approved.

Dr. D. E. Eckart, Hutchinson, extended an invitation to the Society to hold its 1960 meeting in Hutchinson.

The meeting was concluded with the introduction of the new president, Dr. Clyde W. Miller.

OFFICERS FOR 1956-1957

President	Dr. Clyde W. Miller, Wichita
President-Elect	Dr. Barrett A. Nelson, Manhattan
Immediate Past-President ..	Dr. Conrad M. Barnes, Seneca
First Vice-President	Dr. Thomas P. Butcher, Emporia
Second Vice-President ..	Dr. Glenn R. Peters, Kansas City
Constitutional Secretary	Dr. George E. Burket, Jr., Kingman
Treasurer	Dr. John L. Lattimore, Topeka
A.M.A. Delegate 1955-1956 ..	Dr. L. S. Nelson, Sr., Salina
A.M.A. Delegate 1956-1957 ..	Dr. George F. Gsell, Wichita
A.M.A. Delegate 1957-1958 ..	Dr. Lucien R. Pyle, Topeka
A.M.A. Alternate 1955-1956 ..	Dr. Lucien R. Pyle, Topeka
A.M.A. Alternate 1956-1957 ..	Dr. Floyd C. Taggart, Topeka
A.M.A. Alternate 1957-1958 ..	Dr. Norton L. Francis, Wichita
Chairman of Editorial Board ..	Dr. Orville R. Clark, Topeka

COUNCILORS FOR 1956-1957

1. Dr. Frederick E. Wrightman, Sabetha, term expiring in 1957
2. Dr. Glenn R. Peters, Kansas City, 1958
3. Dr. H. Penfield Jones, Lawrence, 1957
4. Dr. Charles E. Vestle, Humboldt, 1958
5. Dr. Severt A. Anderson, Clay Center, 1957
6. Dr. James A. McClure, Topeka, 1959
7. Dr. Edward J. Ryan, Emporia, 1959
8. Dr. James E. Hill, Arkansas City, 1957
9. Dr. L. S. Nelson, Jr., Salina, 1957
10. Dr. Harold M. Glover, Newton, 1959
11. Dr. Norton L. Francis, Wichita, 1958
12. Dr. Albert C. Hatcher, Wellington, 1959
13. Dr. Lloyd W. Reynolds, Hays, 1958
14. Dr. Justin A. Blount, Larned, 1958
15. Dr. Lyle G. Glenn, Protection, 1958
16. Dr. James L. Jensen, Colby, 1959
17. Dr. H. Preston Palmer, Scott City, 1957

NOMINATING COMMITTEE

Five past presidents of the Society were elected by the House of Delegates to name candidates for office in May 1957. Dr. Murray C. Eddy, Hays, will serve as chairman. Other committee members are: Dr. Clarence H. Benage, Pittsburg; Dr. Oscar W. Davidson, Kansas City; Dr. Noble E. Melencamp, Dodge City, and Dr. W. M. Mills, Topeka.

EDITORIAL BOARD

Dr. Orville R. Clark, Topeka, was reappointed chairman of the Editorial Board and editor of the JOURNAL at a meeting of the Council held on May 3. Four other Topeka physicians will also serve on the board: Dr. John A. Segerson, newly appointed for a three-year term, Dr. David E. Gray, Dr. Richard Greer, and Dr. Dwight Lawson.

Thirteen physicians from different geographical areas of the state have accepted appointment to an Editorial Advisory Board. Their duties will be to write and solicit editorials, scientific papers, news notes, and book reviews, assist in the formulation of policies, and act as liaison between the JOURNAL and physicians throughout the state.

The following are now serving on the Editorial Advisory Board: Dr. Virgil E. Brown, Sabetha; Dr. Vernon E. Wilson, Kansas City; Dr. J. G. Hughbanks, Independence; Dr. C. J. W. Wilen, Manhattan; Dr. John L. Morgan, Emporia; Dr. G. E. Kassebaum, El Dorado; Dr. Richard O'Donnell, Ellsworth; Dr. Victor R. Moorman, Hutchinson; Dr. Donald P. Trees, Wichita; Dr. J. A. Howell, Wellington; Dr. Murray C. Eddy, Hays; Dr. J. A. Blount, Larned, and Dr. Dale D. Vermillion, Goodland.

REPORT OF EDITOR OF THE JOURNAL

During the past year your Editorial Board has consisted of Dr. John W. Cavanaugh, Dr. David E. Gray, Dr. Richard Greer, and Dr. Dwight Lawson, with the writer serving as editor and with Dr. Vernon E. Wilson of Kansas City and Dr. Donald P. Trees of Wichita as associate editors.

In physical size the JOURNAL has continued to grow. From 852 pages two years ago, and 928 one year ago, we have now had 968 pages in the current year. I hope that an increase in size has also meant an increased usefulness to the Society.

The total of 37 scientific articles published during the last year is a little lower than for previous years, but this has been brought about by the fact that two issues have not included scientific material. The December issue was devoted to subjects of economic interest, chiefly related to building (and keeping) an estate, and the March issue, though following the tradition of being the University of Kansas issue,

clinically proved in many common infections¹⁻⁶⁰

Hemolytic streptococcal infections

Pharyngitis/Tonsillitis/Sinusitis

Otitis media/Mastoiditis

Scarlet fever/Lymphadenitis/Erysipelas

Staphylococcal infections/Pneumococcal

infections/Gonococcal infections/

Vincent's Infection/Prevention of

streptococcal infection in individuals

with a history of rheumatic fever/

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consisted this year of reports of the activities of the various departments of the School of Medicine. Those articles which we would ordinarily have published in March will be distributed through the coming issues.

We have continued our policy of publishing clinicopathological conferences, tumor conferences, and student theses from the University of Kansas Medical Center.

Our situation in regard to available scientific articles is better than in recent years, and I believe that we have prospects of a continuation of a better status. The publication of two special issues without scientific articles has been a factor in accumulating some reserve supply, as has the fact that several authors have submitted more than one article—either together or nearly so. Much of our fertile source of supply of articles from the state as a whole is, however, as yet untapped.

We have made arrangements with the University of Kansas Medical Center which we expect will make possible the publication of some of the many excellent presentations made in the various post-graduate courses and in special lectureships there. Some of these are being recorded on tape, from which we will make transcriptions preparatory to their subsequent publication. It does involve a considerable amount of effort, particularly in making the transcriptions and editing them, but we have high hopes that it will permit the presentation of interesting material for the JOURNAL. I would particularly like to express my appreciation to Dean Wescoe, Dr. Wilson, and Mr. Nelligan, whose cooperation has made this possible.

Our printing is still being done by The Ovid Bell Press, Inc., of Fulton, Missouri, and our relationships have continued to be most satisfactory.

This noon we had the first meeting of the Editorial Board expanded by the addition of a new Editorial Advisory Board. This Advisory Board is being organized with the hope that by having interested representatives in various geographical sections of the state, we will be able to more truly present the type of JOURNAL which is desired by members of the Society. I hope, and I believe, that these newly acquired representatives of the JOURNAL will be of material assistance in promoting our interests over the state.

I will make no attempt to present a full financial report to this group, for I am sure you do not want to listen to it, and I do not think it necessary. If any desire to have details, they are available; for the present I will state that the bank balance is \$2,248.73 larger than it was a year ago. I take no personal credit for this accomplishment.

I certainly owe a great deal of appreciation to the members of the Editorial Board for all that each has done to carry on JOURNAL activities. Their work is done behind the scenes and is not known to most of you, but I assure you that they have all read numerous manuscripts for critical evaluation and have made decisions on policy, changes of format which became effective during the year, etc.

At this time Dr. Cavanaugh's term is expiring, and after having been on the board for six years he has requested that he not be reappointed. It is with regret that we must comply with his sincere request, for he has demonstrated both interest and loyalty to the JOURNAL over these years, and his contribution will be missed.

Dr. Wilson is a newcomer to the JOURNAL family, having taken over the work formerly done by Dr. Glen Shepherd at the university. He deserves special recognition for collecting and editing the material from the university, particularly the March issue. I feel that Dr. Trees' efforts are in some part responsible for the Wichita group contributing a larger segment of our published papers than any other area, and I thank him for that.

You all know how efficiently and quietly both Oliver Ebel and Rueben Dalbec accomplish the Society work they do, and the same may be said of their JOURNAL activities—no fanfare and no glory, but the accomplishment of all there is to do. Of course the one who really bears the brunt of the work in the JOURNAL office is Miss Pauline Farrell, and after the years during which she has worked for the JOURNAL it becomes difficult to find new ways of expressing appreciation of her work. Her loyalty to the JOURNAL is unquestioned, and her patience with my procrastinations and shortcomings is still difficult to understand—but easy to appreciate. You all understand what a good assistant can do to promote a smoothly and efficiently run doctor's office, and Miss Farrell accomplishes exactly that for the JOURNAL. These three have made it a pleasure to continue my association with this activity of our Kansas Medical Society.

KANSAS BLUE SHIELD

Dr. Francis T. Collins, Topeka, was chosen to serve as president of Kansas Blue Shield at the annual meeting of the Board of Directors held at the Blue Cross-Blue Shield building in Topeka on Sunday, April 29.

Other officers elected were: first vice-president, Dr. L. E. Filkin, Concordia; secretary-treasurer, Dr. Edward J. Ryan, Emporia; second vice-president, Dr. James Fisher, Wichita. Dr. L. W. Reynolds, Hays, is immediate past president.

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The following trustees will serve on the Board during the coming year as representatives of the Medical Councilor Districts:

District 1, Dr. E. T. Wulff, Atchison
 District 2, Dr. P. E. Hiebert, Kansas City
 District 3, Dr. Monti L. Belot, Lawrence
 District 4, Dr. Francis X. Lenski, Jr., Iola
 District 5, Dr. Robert M. Carr, Junction City
 District 6, Dr. Lucien R. Pyle, Topeka
 District 7, Dr. Edward J. Ryan, Emporia
 District 8, Dr. Max Wells, Winfield
 District 9, Dr. H. S. Dreher, Salina
 District 10, Dr. H. M. Glover, Sr., Newton
 District 11, Dr. James Fisher, Wichita
 District 12, Dr. Paul M. Hulett, Anthony
 District 13, Dr. A. M. Cherner, Hays
 District 14, Dr. S. T. Coughlin, Larned
 District 15, Dr. E. B. Scagnelli, Dodge City
 District 16, Dr. Floyd Smith, Colby
 District 17, Dr. G. R. Hastings, Great Bend

Dr. Clyde W. Miller, Wichita, president of the Kansas Medical Society, and Dr. Barrett A. Nelson, Manhattan, president-elect, will also serve on the board.

Lay members are: Ernest Bird, Protection; Russell Mosser, Lawrence; Joe Reilly, Pittsburg; H. P. Reynolds, Moline; B. L. Humphreys, Hutchinson, and John Junior Armstrong, Muscotah.

Positions on the Blue Shield Board are filled from these categories: one doctor from each of the seventeen councilor districts; the officers of the corporation (elected by the board); the president and president-elect of the Kansas Medical Society; the immediate past president of Blue Shield; four lay members elected by the Blue Cross-Blue Shield State Members' Committee, and two lay members appointed by the governor of Kansas.

EYE, EAR, NOSE AND THROAT SECTION

President—Dr. Larry L. Calkins, Kansas City
 Vice-President—Dr. Max S. Lake, Salina
 Secretary—Dr. Victor R. Moorman, Hutchinson

KANSAS CHAPTER, AMERICAN ACADEMY OF GENERAL PRACTICE

President—Dr. Conrad M. Barnes, Seneca
 President-Elect—Dr. Bruce P. Meeker, Wichita
 Vice-President—Dr. Henry B. Sullivan, Sr., Shawnee
 Secretary-Treasurer—Dr. Cloyce A. Newman, Topeka
 Delegate—Dr. George L. Thorpe, Wichita
 Alternates—Dr. Lawrence E. Leigh, Overland Park,
 and Dr. Floyd E. Dillenbeck, El Dorado

KANSAS SOCIETY OF ANESTHESIOLOGY

President—Dr. Dale U. Loyd, Wichita
 Vice-President—Dr. Harold F. Spencer, Emporia

Secretary—Dr. William F. Powers, Wichita
 Treasurer—Dr. Joseph E. Gootee, Topeka

KANSAS OBSTETRICAL SOCIETY

President—Dr. Robert M. Carr, Junction City
 President-Elect—Dr. Charles D. Shrader, Newton
 Vice-President—Dr. Edward X. Crowley, Wichita
 Secretary-Treasurer—Dr. Robert Sohlberg, Jr., McPherson

KANSAS SOCIETY OF PATHOLOGISTS

President—Dr. William J. Reals, Wichita
 Vice-President—Dr. Harry R. Wahl, Kansas City
 Secretary-Treasurer—Dr. Bert E. Stofer, Wichita

KANSAS STATE PEDIATRIC SOCIETY

President—Dr. David R. Davis, Emporia
 Vice-President—Dr. Charles T. Hinshaw, Wichita
 Secretary-Treasurer—Dr. Theodore E. Young, Winfield

A meeting of the society will be held in Emporia on September 8. Dr. Horace Hodes, clinical professor of pediatrics at the College of Physicians and Surgeons, Columbia University, New York, will be speaker.

KANSAS RADIOLOGICAL SOCIETY

President—Dr. Abraham M. Cherner, Hays
 Vice-President—Dr. Lewis G. Allen, Kansas City
 Secretary-Treasurer—Dr. George S. Ripley, Jr., Salina

KANSAS UROLOGICAL SOCIETY

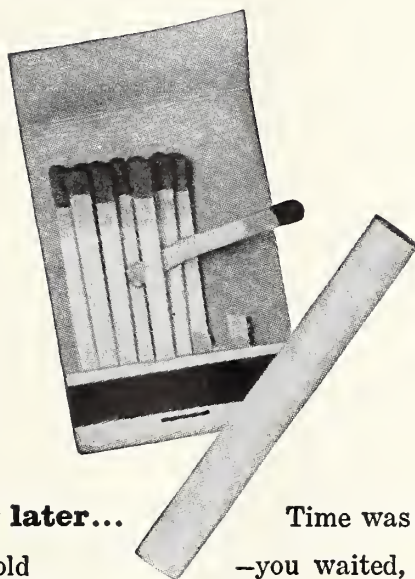
Chairman—Dr. Harold F. O'Donnell, Wichita
 Secretary—Dr. D. Cramer Reed, Wichita

Urologists of Kansas met to consider organization of a Kansas Urological Society and agreed to form such an association. It is expected that 20 charter members will be present at the first meeting of the group in Wichita next May during the annual session of the Kansas Medical Society.

KANSAS ORTHOPEDIC CLUB


President—Dr. John A. Grove, Newton
 Secretary-Treasurer—Dr. Henry O. Marsh, Wichita

At the meeting of the Kansas Orthopedic Club, Mr. L. M. Vance, of the Kansas Crippled Children Commission, discussed the program of that organization. Dr. Paul C. Williams, Dallas, discussed "Lumbosacral Pathology and Treatment." The program was followed by a cocktail hour at the Topeka Country Club and an open house at the home of Dr. Joseph T. Gendel.



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Monday during the week of the annual session was given over to sports events, and prizes were awarded at a sportsmen's banquet held at the Topeka Country Club that evening. Golf winners were as follows:

Championship Flight—Dr. Fred N. Bosilevac, Kansas City; Dr. Ed Ashley, Chanute; Dr. John F. Coyle, Coffeyville; Dr. H. Penfield Jones, Lawrence; Dr. A. W. Bradford, Overland Park; Dr. William L.

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Fourth Flight—Dr. Ray A. West, Wichita; Dr. William M. Scales, Hutchinson; Dr. William O. Martin, Topeka; Dr. Lloyd G. Schwartz, Topeka; Dr. Richard S. Roberts, Ottawa; Dr. Donald R. Pierce, Topeka; Dr. Lucien R. Pyle, Topeka; Dr. George L. Norris, Winfield, and Dr. James A. McClure, Topeka.

Prizes for the sports events were given as follows: Golden Hour clock, Abbott Laboratories; Mr. and Mrs. Calobar sunglasses, American Optical Company; diagnostic kit, Ames Company, Inc.; lighter and cuff links, Armour Laboratories; golf balls, Baxter Laboratories; cigarette lighters, Ciba Pharmaceutical Products; golf balls, Coe Surgical Supply Company.

Vaporizer, DeVilbiss Company; golf balls, Doho Chemical Corporation; table lighters, Dumas-Wilson and Company; golf balls, Eaton Laboratories; golf balls, Eli Lilly and Company; Surgiset assortment, Ethicon, Inc.; electric timer, General Electric Company; golf grips, Hoffmann-LaRoche, Inc.; golf balls, W. E. Isle Company; gift sets, Marcelle Cosmetics, Inc.; gift certificate and golf balls, S. E. Massengill Company; golf balls, William S. Merrill Company; merchandise credit, Mid-West Surgical Supply Company, Inc.; physician's bags, Munns Medical Supply Company, Inc.; golf balls, Ortho Pharmaceutical Corporation; case of Instant Nonfat Powder, Pet Milk Company.

Golf club covers, William P. Poythress and Company; golf balls, A. H. Robins Company, Inc.; steak knives, Smith, Kline and French Laboratories; book, *A History of Medicine*, Charles C. Thomas, Publisher; Cary thermometer, U. S. Vitamin Corporation; lighters, Upjohn Company; prize booklet,



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White Laboratories, Inc.; golf balls, Wyeth, Inc. Additional prizes were contributed by Borden Company and Burroughs Wellcome and Company.

Flying Physicians Association

Seven of the 25 Kansas physicians who are known to be pilots were present at a meeting held in Topeka on May 2 to discuss plans for a state affiliate of the Flying Physicians Association. The group planned a breakfast meeting in Hutchinson on May 27 to perfect organization and to elect officers.

Dr. Robert O. Brown, Atchison, will represent Kansas at a national meeting to be held in Chicago, June 11 to June 15, during the meeting of the American Medical Association.

The purposes of the Flying Physicians Association are: (1) education in aero medical problems; (2) encouragement of already licensed pilots to increase proficiency and win higher ratings; (3) campaign for more protective devices such as safety harnesses, "de-lethalized" instrument panels, and crash-resistant fuselages; (4) provide airplane and accident insurance plans for the benefit of members to eliminate penalties on life insurance policies for private flying; (5) standardization of medical aviation tax deductions; (6) provide a medium through which regional and national fly-ins are planned for meetings and social functions.

Membership in Kansas is open to any physician who holds a pilot's license and belongs to the Kansas Medical Society. Dues for the state organization have not yet been determined. On the national basis, charter memberships are available for \$10. An additional \$15 will entitle the contributor to the status of "Founding Member" and will give the group funds for operation and expansion.

Questions about the organization may be sent to Dr. Lyle G. Glenn, Protection, Kansas.

Survey by Health Information Foundation

A recent survey of public attitudes on many matters of interest to the medical profession was conducted by the Health Information Foundation of New York. Some of the findings, as reported to the American Medical Association, follow.

Forty per cent of the adult population believe food costs are much too high; 45 per cent believe repair charges for work on television sets and cars are excessive; 27 per cent are critical of clothing costs, and only 26 per cent believe that the cost of medical care is much out of line.

Although medical costs in general come in for less criticism than other elements of the cost of living,

within the category of medical costs the percentage believing costs "much too high" for doctors' fees is 16 per cent; hospital charges, 39 per cent; dentists' fees, 24 per cent; prescriptions, 38 per cent.

Fifty-six per cent could not give the name of one company that manufactures a new or "wonder" drug. To the question, "What people or groups do you think have been mainly responsible for these new 'wonder' drugs?" only 11 per cent of the respondents could give specific credit to drug companies, pharmaceutical houses, or the chemical industry. Nine per cent mentioned laboratories, 23 per cent credited doctors, the American Medical Association, or groups of doctors, and 40 per cent credited scientists or such persons as medical researchers and chemists.

We are in the early period of great fundamental advances in biochemistry. These will surely have profound impact, not only upon our knowledge of disease, but also upon the methods of diagnosis.

Reactions which may be brought about in the various physical states make it possible to introduce radioactive atoms as tracers into the most complex and delicate molecules. One can visualize that the diagnostic approach of the physician of the next 25 to 50 years will revolve around the quantitative measurement of the behaviour of specific enzyme systems. The laborious and crude chemical techniques of today will be replaced by precise and rapid procedures of far more discriminating character through the introduction of radioactive atoms into highly specialized compounds of physiological importance.

In our future medical schools, the teaching will of necessity emphasize the dynamic characteristics of intra-cellular reactions which can be observed in the living state without injury to the individual. The morphological concept of disease, as useful and valuable as it is, will become more and more secondary to that of disease as a functional alteration of a vital mechanism.—*Dr. John C. Bugher, Director, Division of Biology and Medicine, United States Atomic Energy Commission.*

The decline in mortality from tuberculosis has been proportionally greater in women than men, adding to the already existing inequality in the number of living men and women in the late years of life. Men, however, have been dying from tuberculosis at a later age than formerly, neutralizing some of the discrepancy, while adding years to their own productive period of life.—*Esmond R. Long, M.D., Bull. Hist. of Med. July-Aug., 1954.*

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Spontaneous Arterial Thrombosis

Development in the Internal Carotid Artery

R. GLENN SNODGRASS, M.D., *Portsmouth, Virginia*

Since the introduction of cerebral angiography as a diagnostic method, the occurrence of spontaneous thrombosis of the internal carotid artery has become increasingly evident. In 1937 Moniz and his co-workers⁷ published the first clinical report of four cases. In all the condition had been mistaken for a space-occupying lesion and diagnosed only by angiography. Fourteen years later, in 1951, when Johnson and Walker⁵ published their collective review, they were able to assemble 101 cases and added six of their own. Since then the condition has been reported with increasing frequency.

It is apparent that, although only recently recognized as a clinical entity, this is not an uncommon disorder. It is also probable that the incidence would be much higher if all patients with hemiplegia were investigated by cerebral angiography.

At present most cases which are discovered are those in which the clinical picture resembles a brain tumor or intracranial vascular anomaly and which are submitted to arteriography. Diagnostic methods used at present avoid fruitless search for other causes of the neurologic syndrome, but a technique of treatment has yet to be devised which will make diagnosis of the condition imperative.

CASE REPORTS

Case 1, D. E., a 44-year-old male truck driver, was admitted to the University of Kansas Medical Center April 14, 1953, because of sudden collapse and hemiplegia. For the past 15 years he had had "migraine" headache. These headaches occurred more frequently and had been more severe during the past three to four months. He had not complained of headache for several days before admission. On the day of admission, while climbing into a truck, he suddenly became unconscious for a period of 15 minutes. On regaining consciousness he was unable to speak or move his right arm and leg. His past history included duodenal ulcer for 24 years, managed medically.

On physical examination he exhibited a pronounced aphasia, mainly expressive in nature. He was able to carry out simple verbal commands. A right homonymous hemianopsia was demonstrable by gross con-

frontation. A right flaccid hemiplegia was present with diminished to normal deep tendon reflexes and a Babinski response on the right. Except for the hemianopsia, examination of the cranial nerves disclosed no abnormalities. The fundi were normal. Pin prick appreciation appeared to be impaired in the right leg. It was impossible to test other forms of sensation. Urinalysis showed a 2 plus sugar. Other laboratory work showed normal findings.

During the first week in the hospital he became more responsive and was able to answer "yes" and "no" to questions but could not speak an intelligible sentence. On April 22, 1953, a left carotid arteriogram was done, showing filling of the external carotid artery only. Injection was repeated with the same result. The needle was then withdrawn, and the artery was repunctured low in the neck. Injection of Diodrast at this site again showed no filling of the internal carotid.

On May 5, 1953, the left carotid artery was explored under procaine anesthesia and found to be thrombosed down to the bifurcation of the common carotid. The vessel was incised, and an old thrombus was partially removed. His subsequent course showed a gradual improvement. He became able to say a few words. His hemiplegia became spastic. He was dismissed from the hospital to receive physiotherapy.

Case 2, W. L., a 46-year-old man, was admitted to the hospital August 10, 1954, because of failing vision and hemiplegia. He first began to have headaches nine months previously and reported they had been more frequent and severe since May 1954. For two months he complained of failing vision and seeing double. He staggered at times and frequently walked into objects. His family had noted a personality change within the last five months; he had become increasingly irritable. On August 6, 1954, he suddenly lost control of his car and ran into a wall. He was found by the police, conscious but unable to move his left arm or leg. He was also mentally confused. He was taken to his local hospital and transferred four days later. Skull films and spinal fluid were reported to be normal.

On admission to the hospital he was drowsy, disoriented, and euphoric. There was a profound left hemiplegia, more severe in the left arm. There was marked left central facial weakness and a left homonymous hemianopsia, determined by confrontation. The left pupil was dilated with homotropine, and the

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Snodgrass is now serving his internship at the United States Naval Hospital, Portsmouth, Virginia.

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disc showed early papilledema. There was a sensory deficit over the left side of the body to pin prick and light touch. Laboratory studies were normal.

In view of the clinical picture and physical findings, a frontal lobe tumor was suspected. Consequently a right carotid arteriogram was done as an emergency procedure. This showed an occlusion of the internal carotid artery about 0.5 cm. distal to the bifurcation (Figure 1). His condition remained unchanged. On



Figure 1. Right carotid arteriogram showing occlusion of the internal carotid artery distal to the bifurcation of the common carotid artery.

the eighth hospital day a pneumoencephalogram was done which showed impaired filling of the occipital horn on the right. He was discharged August 21, 1954, unimproved.

Case 3, H. W., a 38-year-old farmer, was admitted to the hospital February 15, 1955, because of weakness of the left arm and difficulty in speaking. He had been in good health until one and one-half months before admission when he was seized by a sudden attack of numbness of the entire left upper extremity, most marked in the hand. This episode lasted about 30 minutes, during which time there was no paralysis of the limb. During the next three weeks he had about 20 similar attacks, in some of which a numbness over the left chest was noted. He also noticed, during this time, a tendency to forget things he had done. In mid-January his left arm began to get progressively weaker, and numbness was present continuously. He awoke on January 17 confused and unable to speak or to move his right arm. At that time he was hospitalized for three weeks. His weakness and aphasia gradually improved, but he was unable to spell or read as well as before. The numbness of his left upper extremity had persisted, and two days before this admission he had noticed rapid twitching of the eyelids and blurring vision. Spinal fluid during his hospitalization elsewhere was reported

to contain blood. At no time did he have headache.

On physical examination there was noted a distinct weakness of the left arm, about 50 per cent of normal, and fine motor movements were impaired. Reflexes of the left arm were hyperactive, and there was a positive Hoffman's sign on the left. There was no weakness of the left leg or face. His speech was hesitant and his ability to calculate or spell was poor. He omitted one letter in spelling his own name. There was no impairment of sensation, and the cranial nerves were normal. Routine laboratory studies were normal. Electroencephalography and spinal fluid were also normal. On February 17, 1955, a right carotid arteriogram showed thrombosis of the internal carotid artery about 1 cm. above the bifurcation (Figure 2). He was released unimproved.

ETIOLOGY

Males are affected by this condition more than five times as often as females.⁵ There is a definite predilection for the 30- to 60-year age group although King and Langworthy⁶ described a case in a seven-year-old boy in whom thrombosis of the right internal



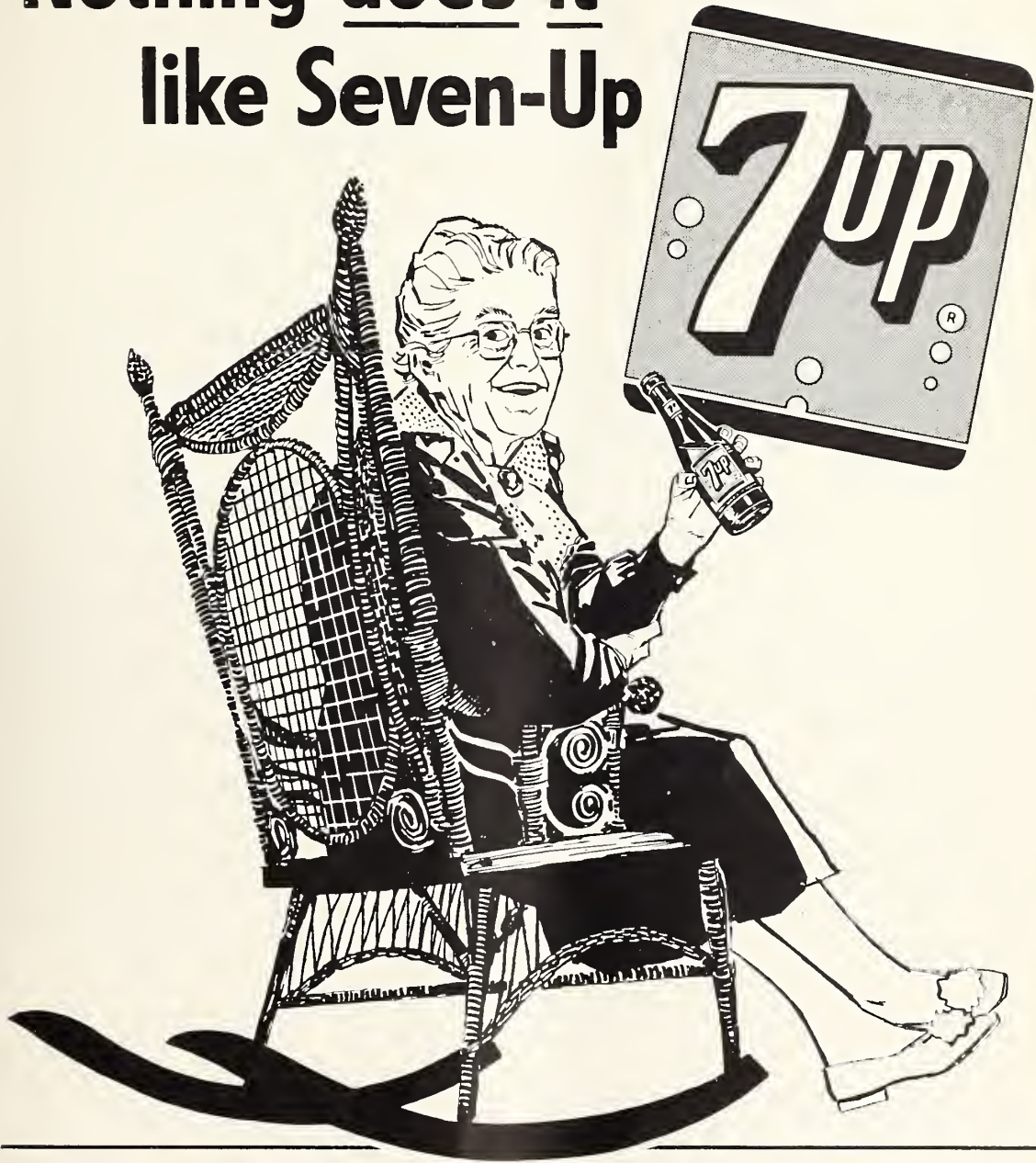
Figure 2. Right carotid arteriogram. The arrow indicates the point of occlusion of the internal carotid artery.

carotid artery developed three weeks after pneumonia. There is a definite tendency for the thrombosis to involve the left side more often than the right. Sixty-five per cent of cases reviewed by Johnson and Walker⁵ involved the left side.

The most common etiology reported in the literature is arteriosclerosis. Galdston,³ Webster,¹³ and others have found atherosclerosis in a resected portion of the involved artery.

Thromboangiitis obliterans has been considered the second most common cause. Fisher² believes the evidence for cerebral thromboangiitis obliterans, as recorded in the literature, is inconclusive and states

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"further proof is necessary before thromboangiitis obliterans of the carotid and cerebral arteries can be accepted."

Gurdjian⁴ reported a case in which occlusion of the middle cerebral artery was demonstrated by arteriography. One and one-half years later the patient suffered a "stroke," and repeat angiography showed the occlusion to be in the neck, suggesting retrograde extension of the thrombus.

Aneurysm of the aortic arch has been considered as a possible etiologic agent in this condition.³ King⁶ has described a case associated with a long-standing traumatic aneurysm of the innominate artery. Retrograde thrombosis from an intracranial aneurysm has also been considered.

SYMPTOMS AND DIAGNOSIS

The basic features of spontaneous occlusion of the internal carotid artery are headache, hemiplegia, and aphasia. Although the basic pattern is fairly constant, the actual clinical picture is highly variable. Considering that the blood supply of an entire cerebral hemisphere is concerned, we would expect a wide variety of neurologic symptoms. It is also probable that thrombosis can occur with few or no symptoms, for surgical ligation of the carotid artery can be done in many cases without harm.^{10, 12} The onset of the patient's illness usually follows one of three different patterns.

1. Sudden apoplectic onset. Patients in this group may experience without warning a severe headache with rapid onset of hemiplegia and aphasia if the dominant hemisphere is affected. There is usually loss of consciousness, and there may be sensory disturbances.

2. Slowly progressive course. This picture closely resembles that encountered in brain tumors in which the clinical course is one of slow gradual progression of symptoms. There is frequently a history of severe headaches of several months to several years duration. Paresthesias and weakness may appear. Some degree of mental regression and speech impairment is common. A rapid increase in symptomatology usually occurs just before the patient seeks medical care.

3. Transient attacks. Transient attacks were encountered in 40 per cent of cases reviewed by Johnson and Walker⁵ and in the 25 cases reported by Poppin and Baird.⁸ These are characterized by a sudden onset of symptoms which last from a few minutes to an hour and clear either suddenly or gradually. Some residuals may persist until the next attack which may occur days, weeks, or months later. The most common symptoms are headache, paresis, paresthesias, and aphasia. Also reported are transient attacks of dizziness, unilateral blindness, unconsciousness, and focal seizures. Not infrequently such a series of transient attacks is terminated by a sudden apoplectic onset of hemiplegia and aphasia.

Hemiparesis is the most constant finding, occurring in approximately 80 per cent of cases reviewed by Johnson and Walker.⁵ The degree of weakness is variable, but the hemiplegia most often has its onset and is most severe in the hand, spreading to involve the arm, leg, and perhaps the face. Associated with hemiplegia there may be a severe cortical sensory impairment.

Headache has been reported in more than 50 per cent of cases⁵ and was present in two of the cases reported here. Headache may be mild or severe; it may be localized to the affected side, but more often it is generalized and frequently precedes any other symptoms. The diagnosis of migraine is frequently made in these patients.²

In contradistinction to the motor disturbances, which are practically always present, objective impairment of discriminative cortical sensation is a variable finding. Often there is a slight disturbance; however, in those cases with sudden severe hemiplegia, all sensation may be involved.

Both receptive and expressive aphasias frequently are encountered. These may be present as prodromal symptoms or associated with hemiplegia. Rarely aphasia may be present in right-handed patients on occlusion of the right internal carotid artery.⁹ According to the data compiled by Johnson and Walker,⁵ it was present in 60 per cent of cases.

Ophthalmologic features may be a homonymous hemianopsia demonstrable at the time of the "stroke." Primary optic atrophy with unilateral blindness is not uncommon. More unusual changes are diplopia, ptosis, and papilledema.

Emotional changes occur in about 15 per cent of cases, manifested usually as depression and irascibility with marked deterioration of mental function. Twenty per cent of patients have convulsive attacks, and one-half of these are focal in nature.

Fisher² believes that palpation for carotid pulsations is of great value, especially a short time after the major stroke. Pulsation in the external carotid artery is said not to be confusing if high palpation is done, for the external carotid artery soon divides into many small branches.

Dunning¹ recently reported a method of pharyngeal palpation of the internal carotid and considered that absence of pulsation, as determined by this method, identifies the condition.

The only certain methods of making the diagnosis are carotid arteriography and surgical exposure of the vessel in the neck. Shapiro and Peyton⁹ consider the following arteriographic findings strong evidence for occlusion of the carotid artery:

1. A conical narrowing of the dye before it stops, resulting in a short stump of the internal carotid artery.
2. Failure to fill the internal carotid artery and a

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LOS ANGELES

defect in the column of dye produced by the thrombus.

3. Retrograde flow of dye in the common carotid artery and, on the right side, the flow of dye through the innominate artery into the vertebral artery resulting in a vertebral arteriogram.

4. Irregularities in the diameter of the vessel and narrowing of the vessel.

Failure to fill the internal carotid artery after repeated attempts must be interpreted with reservation since it may be due to technical difficulties.

TREATMENT

Several forms of treatment have been attempted but none has been encouraging. Strully and co-workers¹¹ were able to remove a recent thrombus of the internal carotid artery for a distance of 7 cm. by suction catheter, but they failed to remove the clot completely. Poppin and Baird⁸ routinely did an immediate continuous procaine stellate block by polyethylene tube in patients suspected of having thrombosis of the internal carotid artery. When the diagnosis was confirmed by angiography, the artery was explored. If no pulsations were present, they excised a portion of the internal carotid artery and the superior and middle cervical ganglia. This treatment was based upon the thought that impulses arising at the site of the local vascular disease cause reflex spasm of smaller cerebral vessels. Their results, however, were not encouraging. Wolfe¹⁴ has found recanalization of the thrombus, suggesting that excision should not be done.

Prolonged use of anticoagulants has been tried with the hope that recanalization will take place before the occurrence of the final disastrous occlusion.

SUMMARY AND CONCLUSIONS

The etiology, symptoms, diagnosis, and treatment of spontaneous thrombosis of the internal carotid artery have been presented. The cause of this condition appears to be arteriosclerosis in most cases. A positive diagnosis can be made only by arteriography or operation. Treatment is unsatisfactory.

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ANNOUNCEMENTS

Scientific and clinical session, American Congress of Physical Medicine and Rehabilitation, The Ambassador, Atlantic City, September 9-14. Open to members of the A.M.A. Information may be obtained from the Congress, 30 North Michigan Avenue, Chicago 2, Illinois.

Eight-week course in occupational medicine, Post-Graduate Medical School of New York University-Bellevue Medical Center, September 10-November 2. Information is available from Dean, N.Y.U. Post-Graduate Medical School, New York 16, New York.

Applications now being accepted for 1957 Part I examinations of American Board of Obstetrics and Gynecology. Deadline, October 1. Information may be secured from Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6, Ohio.

Annual assembly in otolaryngology, University of Illinois College of Medicine, October 1-7. Information available from the Department, 1853 West Polk Street, Chicago 12, Illinois.

Annual convention, National Society for Crippled Children and Adults, Hotel Statler, Washington, D. C., October 28-31. Programs may be secured from the Society, 11 South LaSalle Street, Chicago 3, Illinois.

Fourth Interim Congress, Pan American Association of Ophthalmology, Hotel Statler, New York City, April 7-10, 1957. Information is available from Dr. Frank H. Constantine, 30 West 59th Street, New York 19, New York.



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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

As might be expected, a presidential commission's report on veterans' pensions that also goes into the subject of non-service connected medical benefits is stirring up another controversy.

The President's Commission on Veterans Pensions, headed by Gen. Omar Bradley, World War II leader and postwar Veterans Administrator, conducted a study covering more than a year in time and a wide range of subjects. It produced a 415-page report and a total of 70 recommendations.

The seven-man commission's report has this basic premise: military service in time of war or peace should be treated as discharging an obligation of citizenship and not of itself as a basis for future government benefits.

The commission made this additional point: "... under conditions of modern technology and warfare, the national defense might be served equally well by a civilian in a scientific laboratory or a war plant as by a uniformed serviceman—and in view of total war and atomic weapons, perhaps with greater personal hazard to the civilian. This further suggests that the special needs that veterans have because of military service should not be confused with the needs that all citizens have in common for such things as education, health services, and economic security."

With this in mind, the commission proposes the gradual elimination of non-service connected benefits and observes: "Their justification is weak and their basic philosophy is backward looking rather than constructive." Such benefits, it adds, should be limited to a minimum level and retained only as a reserve line for veterans who fail to qualify for basic protection under Old Age and Survivors Insurance (Social Security).

The commission then goes one step further by recommending an end to the present automatic "presumption of service-connection" procedure. Now, presumption of service connection is automatic and mandatory for certain diseases if the condition is diagnosed within a specific period of time following discharge. Instead, the commission would substitute medical determination for chronic and tropical diseases, psychoses, tuberculosis, and multiple sclerosis, with each case decided on its own merits.

Other recommendations: (1) increased reliance on the OASI system for certain veterans' benefits, (2)

prompt counseling of all veterans placed on compensation rolls as to VA and federal-state rehabilitation programs, and (3) requirement of reasonable medical or surgical treatment before payment of compensation.

Representatives of veterans groups called before the House Veterans Affairs Committee to comment on the Bradley study complained that some of its proposals would be "extremely destructive" to certain aspects of veterans' compensation.

Two committees of Congress, after long studies of problems of narcotics, barbiturate and amphetamine addiction, have come up with recommendations that the U. S. tighten penalties on narcotics peddling and smuggling, outlaw heroin, and set up a central unit in the Federal Bureau of Narcotics to keep track of known addicts. The proposals were made by the Senate Judiciary Committee and a House Ways and Means Subcommittee.

The House committee also suggested a law for more stringent controls over barbiturates and amphetamines.

The Senate committee rejected the proposal backed by the New York Academy of Medicine for "clinics" where known addicts could go for regular doses of narcotics.

U. S. Public Health Service is advising private physicians as well as health officers to increase their use of Salk poliomyelitis vaccine. Although supplies now lag behind demand, the expectation is that before the summer is out the situation will be reversed. In line with this recommendation, PHS is urging that physicians use what supplies they have on hand immediately, depending on future production to take care of second and third shots.

Because the President signed the military career incentive bill promptly, physicians in uniform received their pay raises starting May 1. The minimum boost (after two years' service) is \$50 per month, the maximum (after 10 years) \$150.

Private-profit nursing homes, hospitals, and some other medical facilities soon will have an opportunity to obtain U. S. loans from the Small Business Administration. The limit is \$250,000 per project, the interest rate usually 6 per cent.

If there was any question about it, the AFL-CIO as a joint organization favors national compulsory health insurance, as each group did before the merger. The AFL-CIO stand was taken officially for the unions by Nelson Cruikshank in testimony before the House Ways and Means Committee on a bill for increased payments for the medical care of public relief recipients.

in rheumatoid arthritis

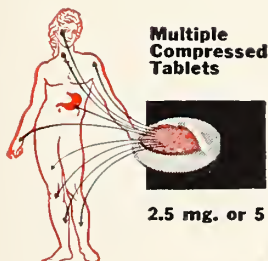


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References: 1. Boland, E. W., *J.A.M.A.* 160:613, February 25, 1956. 2. Margolis, H. M., *et al.* *J.A.M.A.* 158:454, June 11, 1955. 3. Bollet, A. J., *et al.* *J.A.M.A.* 158:459, June 11, 1955.

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COUNTY SOCIETIES

Panel discussions have formed the programs for two recent meetings of the Wyandotte County Medical Society. "Medical Press Relations" was the subject discussed on April 19 by Mr. Conwell Carlson and Mr. R. E. Sisney of the *Kansas City Star*, Mr. Cyril G. Scott of the *Kansas City Kansan*, Mr. Lee Vaughan of the legal profession, Dr. Francis J. Nash, and Dr. William T. Sirridge. Dr. Maurice Ryan was moderator.

At a meeting on May 15 Dr. Frederic Speer was moderator. "Hospital Chaplaincy" was the subject for the participants, the Rev. John J. Lacy of Providence Hospital and the Rev. Donald C. Houts of Bethany Hospital.

Members of the Riley County Society were entertained at a smorgasbord dinner at the Wareham Hotel recently by members of the Riley County Auxiliary.

A meeting of the Central Kansas Medical Society was held at Hays on May 17. Dr. Tom Gray, Wichita, spoke on "Dermatoses of the Hand," and Dr. John W. Warren, Wichita, discussed "Carcinoma of the Prostate." Members of the Auxiliary were guests of the physicians for a dinner after the scientific program.

Growth of Blue Cross

The largest enrollment growth since 1950 was recorded by Blue Cross during 1955, according to the plan's annual report issued last month. More than 3,000,000 persons were enrolled during the year just past. Membership in the plan now includes nearly one out of every three persons in the United States.

Ford Foundation Grant Program

A \$10,000,000 program of matching grants to the National Fund for Medical Education has been announced by the Ford Foundation. The grants will be made on a matching basis over a five-ten-year period

with a maximum limit in any one year of \$2,000,000.

Last year the National Fund, which distributes monies raised by A.M.E.F. and contributions from industry and the general public, received \$2,147,000 in unearmarked funds for distribution to the nation's medical schools. Of this amount, \$422,812 came from the medical profession. Under the Ford Foundation formula, if receipts are of equal size in 1956, a Ford grant totaling 70 per cent of this amount, \$1,503,486, would be made. All contributions in excess of the 1955 total would be matched dollar for dollar, subject to the maximum of \$2,000,000.

The program could last for ten years but might be accelerated to completion in five years, depending upon the rate at which additional contributions are developed.

Cancer Research Grants to Kansans

Cancer research grants-in-aid to five University of Kansas Medical Center physicians were announced last month by the American Cancer Society.

Dr. Chauncey G. Bly, associate professor of pathology and oncology, received \$6,500 for a project entitled "Tumor-Host Interactions in Animals." Dr. Harlan I. Firminger was granted \$5,000 for studying "Correlation of Morphological and Biological Characteristics of Induced Liver Tumors in Rats." A sum of \$4,255 was awarded Dr. Alvar A. Werder and Dr. Creighton A. Hardin for studying "The Influence of Humoral Factors on the Transplantability of Malignant and Non-Malignant Tissue." Dr. Max Beronbom received \$6,400 for a program entitled "Mechanism of Azo Dye Carcinogenesis."

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*Moyer, J. H., and Hughes, W. M.:
J. Chron. Dis. 2:678, 1955.

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BOOK REVIEWS

Therapy of Fungus Diseases: An International Symposium. Edited by Thomas H. Sternberg, M.D., and Victor D. Newcomer, M.D. Published by Little, Brown and Company, Boston. 337 pages. Price \$7.50.

This book consists of papers presented June 22-25, 1955, at the symposium held by the Division of Dermatology, Department of Medicine, and Medical Extension of the University of California at Los Angeles. It includes discussion of superficial and deep fungus infections as well as much laboratory research work.

Extensive work has been done on coccidioidomycosis and histoplasmosis with no cure as yet. Blastomycosis and sporotrichosis have responded well to therapy; nocardia has responded favorably; many other fungus diseases are also discussed.

Endemic areas of the various pathogenic fungi were discussed and soil studies under various climate conditions were performed, but no definite reason was found for the localization.

Fungus diseases of India, France, Argentina, Brazil, Mexico, the Philippines, and the Ukraine were also presented.

This book is interesting, especially so to those engaged in experimental and research investigations of fungus diseases.—G.W.N.

Vascular Surgery in World War II, Medical Department of the United States Army. Edited by Daniel C. Elkin, M.D., and Michael E. DeBakey, M.D. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price \$4.25 (buckram).

Vascular Surgery in World War II is one of a series of professional, clinical and technical volumes of the Medical Department of the United States Army published under the direction of the Office of the Surgeon General. This book of 437 pages is composed of 16 chapters. The authors of many of these chapters are surgeons well known in the field of vascular surgery in American medicine today.

There is included discussion of the management of arterial injuries in the acute and residual states. There is an excellent chapter on the evaluation of the vascular status in traumatic and non-traumatic lesions of the blood vessels. This text often advises techniques of procedures, types of incisions, and criteria for the selection of cases.

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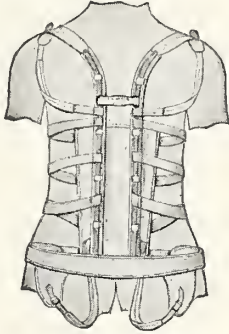
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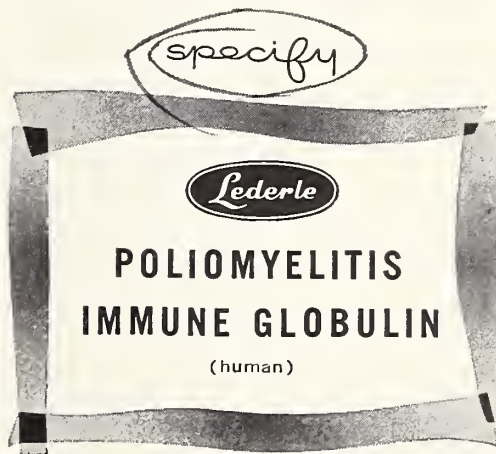
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World War II, and the summary of how and why these advancements were accomplished is detailed in this volume. It is a most interesting work and would be of extreme importance to every general surgeon as well as anyone doing vascular surgery.—L.L.S.

developments and improved techniques of treatment such as new drugs and modern surgery. The value of medical care should be so well understood that the average American will seek his physician's advice in time to gain the most from the treatment prescribed."

Progress in Health Services

Progress in Health Services is the name of a new monthly bulletin designed to interpret health statistics for laymen. It is published by Health Information Foundation, an organization sponsored by 200 companies in the drug, pharmaceutical, chemical, and allied industries.

"Although Americans have greatly benefited from the impressive strides made in the medical-health fields since 1900," said Mr. George Bugbee, president of the Foundation, "they nevertheless are not making full use of today's abundant health services and facilities. Bringing broader understanding of the value of medical care to the public is a responsibility of the health field which begins with a knowledge of what has been accomplished and what benefits already have accrued to us nationally.

"Full benefit from the wise use of medical care by everyone requires better knowledge of the great strides in health which have come through scientific

Gain in Graduate Medical Education

Training programs for newly-graduated doctors have become as big—in terms of enrollment and time spent—as basic medical school education, it was reported recently by the Council on Medical Education and Hospitals of the A.M.A. Enrollment of young physician graduates as interns and residents for the 1954-1955 year passed that of students in undergraduate medical schools.

The council's annual report showed 9,066 graduates serving internships and 20,494 serving as residents, a total of 29,560 in 1,364 hospitals. The average cash stipend paid to interns by hospitals affiliated with medical schools is \$87 a month. Hospitals not affiliated with schools pay \$136 a month on the average.

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Pamphlets Available

A number of pamphlets of interest to physicians are available on request to the Kansas State Board of Health, Topeka. These pamphlets, purchased with tax funds and distributed without charge, include the following titles: *Maternal Care and Mental Health*, a WHO monograph; *Standards for Care of the New-born*, American Academy of Pediatrics; *American Public Health Association Standards on Services to Handicapped Children*, APHA Monograph on *Well Child Supervision*, and others.

Of 1,200 women who graduated from medical school between 1925 and 1940, 49 per cent have been engaged in full-time practice since graduation. This compares with a percentage of 91 for men who were graduated during the same period. The figures were released recently by the John and Mary R. Markle Foundation which established a grant for a study of women in medicine.

Specialties of the women, in order of frequency, are: pediatrics, psychiatry, obstetrics and gynecology, and internal medicine. For men, surgery is most popular, followed by internal medicine and obstetrics and gynecology.

The study showed also that women physicians earn less than the men but in general work fewer hours per week. One-third of the women studied are unmarried. In the group of married women physicians, the common pattern is full-time practice for a period, followed by part-time practice or none at all.

The A.M.A.'s Committee on Medical Motion Pictures distributed more than 3,000 films last year to medical societies, medical schools, hospitals, and other professional groups. Newest addition to the library of pictures is a film entitled "The Doctor Examines Your Heart," prepared especially for the physician speaking before high school health classes or service clubs.

If one were to use as criteria the amount of life spoiled by disease, instead of measuring only that destroyed by death; or the number of days lost from pleasure and work because of so-called minor ailments; or merely the sums paid for drugs, hospitals, and doctors' bills, the toll exacted by microbial pathogens would seem very large indeed. Microbial diseases have not been conquered. Rather, scientists have resigned themselves to the belief that a relative protection against them can be had only at the cost of a huge ransom.—Rene J. Dubos, Ph.D., *J.A.M.A.*, April 23, 1955.

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1. Davidson, D. T., Jr.; Lombroso, C., & Markham, C. H.: *New England J. Med.* 253:173, 1955.

2. Zimmerman, F. T.: *New York J. Med.* 55:2338, 1955.



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TABLE OF CONTENTS

JULY, 1956

Scientific Articles

- Rehabilitation: Restoration of Function after Fractures Is an Important and Sometimes Neglected Feature of Their Treatment—Charles R. Rombold, M.D., Wichita 403
- Purpura: Some Observations on the Clinical Aspects of Thrombocytopenic Purpura—Robert P. Norris, M.D., Wichita 407
- Alseroxylon: A Study of the Psychological Effects of the Drug—William T. Wright, M.S., Charles Pokorny, M.D., and Thomas L. Foster, M.D., Halstead 410
- Cerebral Palsy: The Physical, Psychological, and Speech Status of Children Seen in the University of Kansas Medical Center Clinic—

W. David Francisco, M.D., Kansas City,
Margaret C. Byrne, M.A., Evanston, and
Mirian Tate Elkin, Ph.D., Kansas City . . . 413

Editorials

- Code of Ethics 417
- Hospital Accreditation 417

Miscellaneous

- President's Page 416
- Clinicopathological Conference: Chest Pain and Sudden Death in a Hypertensive Woman . . . 420
- Senior Thesis: Mental Disease—Development and Present Status of Surgical Treatment—Dean Collins, M.D., Panama Canal Zone . . . 436

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Rehabilitation

Restoration of Function after Fractures Is an Important and Sometimes Neglected Feature of Their Treatment

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The patient with a fracture which has a good end result obviously needs no rehabilitation. However, the patient with a fracture result which is less than perfect either should have, maybe should have, maybe should not have, or should not have rehabilitation. It is in the middle area of maybe, where all is neither white nor black but where there exists a middle band of grey, that judgment and experience must be exercised to a high degree. Shakespeare's Hamlet stated the case succinctly when he analyzed his own dilemma in these words:

"To be, or not to be, that is the question;
Whether it is nobler in the mind to suffer
The slings and arrows of outrageous fortune,
Or to take arms against a sea of troubles,
And by opposing end them?"

The physician faced with a poor fracture result has as unpleasant a dilemma from which he must extricate himself as had young Hamlet of Shakespeare's play. A conscience is necessary sometimes to have the courage to "suffer the slings and arrows of outrageous fortune," and experience is required to know when one can with confidence "take arms against a sea of troubles." The decision must result from the physician's knowledge of the capacity of a body to rise above its difficulties, also from his experience in the evaluation of end results, and from his appraisal of the cost of rehabilitation in terms of dollars, pain, and morale.

An exact formula cannot be concocted which would resolve all fractures with just so many degrees of angulation to surgical correction or all cases of non-union to grafting, or painful joints to fusion. Ob-

viously a crooked painless leg would be of less moment to the farmer than to the debutante; on the other hand, a painful result in the wrist of a society matron would be of less moment than it would be to a mechanic. The decision of the rehabilitation of

The material presented in this paper is Part I of a four-part series to be published in the Journal. Part II will appear in August, Part III in September, and the concluding installment in October.

a poor fracture result must rest on a knowledge of what procedures are available to improve it and if that improvement is a good investment of time, money, and pain for the patient.

To summarize, the various factors requiring evaluation in each case presenting less than a perfect fracture result are:

1. Is the disability either in function or appearance great enough now or is there a probability that it will be in the future great enough to warrant efforts to diminish it?
2. What rehabilitation measures are available which can be expected to improve the result?
3. Is the cost in time, dollars, and pain commensurate with expected improvement?

Now what complications may present themselves in the course of the treatment of a fracture or subsequent to its treatment which require a physician to

make such a decision as to the advisability of instituting rehabilitation measures?

The principal complications which may occur to prevent a perfect result in a fracture case are:

1. Post-traumatic dystrophy.
2. Delayed union.
3. Nonunion.
4. Malunion: Shortening, Angulation, Cross Union.
5. Aseptic necrosis.
6. Miscellaneous.
 - A. Limited joint motion.
 1. Adhesions within the joint capsule.
 2. Adhesions between the synovia-capsule structures and the articular surfaces.
 3. Contractures of muscles immobilized in an unphysiological position.
 4. Incarceration of muscles in the healing process at the fracture site.
 - B. Nerve Damage.
 1. Direct result of fracture.
 - As musculo-spiral in humerus.
 - As paraplegia.
 2. Indirect result of fracture.
 - As cast pressure—lateral peroneal.
 - Tourniquet paralysis.
 - Injury in the course of open reduction.
 3. Late, as median neuritis in Colles' fracture.
 - C. Ischemic Contractures.
 1. Volkmann's.
 2. Ischemia resulting from Bryant's traction.
 - D. Osteomyelitis.
 1. Compound fractures.
 2. Secondary to open reduction, etc.
 - E. Decubiti.
 - F. Psychic.
 1. As fear, pride, inadequacy, despondency, etc.
 2. As compensationitis.

POST-TRAUMATIC DYSTROPHY

Exacerbation of pain in an extremity four to ten days after its fracture should awaken your immediate and continued special attention. Like the alarm clock demanding your recognition in the morning, so should this type of pain demand your observant care. Pain recrudescence in a fractured extremity, particularly if the fracture is a Colles' or of the os calcis, four to ten days after the accident is pathological. After four to ten days, when symptoms should be subsiding in an extremity fracture, there may be a rapid onset of pain, usually severe, particularly in the metacarpal or metatarsal and phalangeal areas. It is described as a severe, constant ache; sharp with any attempted movement; unrelated to position; frequent burning; causing insomnia; usually requiring analgesics, often codein or morphine.

On examination there is a palpable temperature aberration when compared to the opposite extremity—either warmer or colder; the digits usually are swollen; there may be duskiness of the fingers or toes; and they are definitely tender when palpated and painful with either active or passive movement. The patient may become apprehensive and guard his extremity with anxiety lest some one move it or brush against it.

These findings are indicative of a post-traumatic dystrophy and require that you heed the alarm lest you precipitate your patient into a serious, long convalescence and develop a monstrous headache for yourself.

Post-traumatic dystrophy should be recognized early, the earlier the better, because results of proper treatment are dramatic and because failure to treat properly is catastrophic. Prompt treatment will give prompt relief; and prompt treatment will prevent a painful, disabling, three-year convalescence with almost certainly some permanent residual disability. Loosening the cast, anti-arthritis medication, physical therapy, etc., are ineffective in giving relief in the acute stage, in shortening convalescence, or in diminishing residual disability.

The only effective treatment for post-traumatic dystrophy is the injection of novocaine into the sympathetic plexus supplying the extremity involved. Prompt injections should be repeated as often as the symptoms recur, and even a surgical sympathetic plexus resection should be considered. Occasionally one injection is sufficient, but usually multiple ones are required at increasing intervals.

DELAYED UNION

Delayed union is an unusual retardation in the healing process of a fracture beyond that period when it normally would be considered united. Delayed union has a peculiar affinity for specific fracture sites in certain bones—such as the junction of the lower and middle thirds of the tibia, mid shaft of the humerus, the femoral shaft, and the carpal scaphoid. On the other hand, fractures through the neck of the humerus, distal metaphysis of the radius, the ilium, etc., heal rapidly, solidly, and almost invariably on schedule.

It appears sometimes, to the more pessimistic fracture men, that some bones almost refuse to heal even with the best of treatment, while other bones heal in spite of poor or no treatment. Delayed union may completely disorganize not only the plans made by the patient for the future but also the prognostications of the physician. It is indeed a wise physician who, in the treatment of any fracture, particularly those susceptible to nonunion, gives an indefinite date when union will occur.

Delayed union must be differentiated, if possible,

from nonunion, though naturally in the course of a nonunion delayed union is the first stage. One may conclude he is dealing with a delayed union and one which has not yet demonstrated the necessity of surgical intervention, if in a fracture there is clinical or x-ray evidence of inadequate union after the time has elapsed when healing normally should have been expected and there exists in the x-ray:

1. No eburnation of the adjacent fracture surfaces.
2. No apparent defect in the bridging callus.
3. No tapering of the fracture ends.
4. No progressive widening of the fracture line.
5. No plugging of the medullary canal.

Delayed union may be caused by:

1. Your guess is as good as mine.
2. Distraction after reduction.
(Heavy leg cast with knee extended)
3. Inadequate immobilization.
4. Interposition of soft tissue.
5. Inadequate reduction.
6. Infection.
7. Vascular impairment.
8. Pathological status.
9. Metabolic disturbance.

Delayed union is a result of a slowing or cessation of the normal progression of callus formation about the fracture site. Roughly the stages of fracture healing are hemorrhage, fibroplasia, calcification, and osteogenesis. The crux of the solution of a delayed union then is to accelerate or initiate the healing process at whatever stage it has slowed or ceased so that it will complete its healing cycle.

New hemorrhage about the fracture site and hyperemia of the adjacent contiguous tissues might, by reproducing the early stage of a fracture, stimulate a lagging healing process. Hemorrhage and hyperemia could follow a rough manipulation, weight bearing, drilling, etc. Occasionally a slow union may be accelerated by a manipulation followed by rigid immobilization. This procedure requires courage and is occasionally more harmful than helpful. On the other hand, the application of rigid immobilization, followed industriously and assiduously by function, more safely achieves the same end of causing increased hemorrhage at the site of fracture. Protected weight bearing has the additional advantages of causing hyperemia in the adjacent tissues and of stimulating by function all of the cells of the part, including the osteoblasts.

In a delayed union of a fracture of the leg, a close fitting, unpadded walking cast is excellent therapy as it not only results in new hemorrhage and hyperemia of the part but also maintains the fragments impacted. Similarly function frequently can be instituted with resultant activation of the healing process

in fractures of the upper extremity by the application of an unpadded, close fitting plastic cast.

Drilling across the fracture line will produce new hemorrhage, new channels for vascularization, and some bone fragments. It may be an operative procedure of some value in the occasional case of nonunion. However, if any operative procedure is instituted to stimulate a delayed union, that procedure should be the one most likely to succeed which is, of course, bone grafting. Surgery should be reserved for the definite case of nonunion and rarely is indicated in delayed union. Conservative measures should be continued until all possibility of success is exhausted, and frequently the physician will be pleasantly surprised by the efficacy of patience.

There are other means of producing hyperemia about the fracture such as diathermy, circulatory exercises, vasodilator medication, pressure cuff techniques, etc., which are probably beneficial. However, function with protective rigid immobilization is the most effective means of accelerating or initiating the lagging fracture healing cycle.

The administration of calcium, phosphorus, vitamins, and a diet of spinach, milk, et al. is an excellent placebo to occupy the mind, time, and intestinal tract of the slow healer. So far as accelerating the healing of a delayed union is concerned, it is useless except in cachectic states. The diet and medication approach to a delayed union problem is wishful thinking and without demonstrable value. Of course there may be some incidental general, non-specific value of a well rounded diet, and certainly the patient's physician cannot be criticized for having neglected his patient if chalk and spinach are administered in large quantities. The average patient is so imbued with the necessity of taking calcium and vitamins that their administration should be considered as practicing the art rather than the science of medicine. Certainly chalk and spinach will do him no harm at any rate and will satisfy his craving to be doing something specific for his condition.

How long should a physician persevere in the treatment of a delayed union before he concedes the condition to be that of a nonunion? There is no specific time limit, and I have not infrequently seen a delayed union finally heal solidly when two or three years have elapsed after treatment was terminated.

NONUNION

It should be accepted that the number of months which have elapsed following a fracture is not the criterion of the diagnosis of nonunion. There are certain specific x-ray findings which designate a fracture to be a nonunion, and when these are recognized a more certain approach to the diagnosis may be established. Specific x-ray findings which designate a nonunion in the shaft of a long bone are, again:

1. Eburnation of the adjacent fracture surfaces.
2. Apparent defect in the bridging callus.
3. Tapering of the fracture ends.
4. Progressive widening of the fracture site.
5. Plugging of the medullary canal.

Any one of these findings is suggestive of a nonunion, and any two are diagnostic. After the diagnosis has been made, then the careful appraisal of the personal, economic, and social factors previously mentioned must be made to determine the avenue of approach to the situation. Either the nonunion must be accepted as a permanent condition and a prosthetic solution offered, or an attempt made to cure the defect by a surgical approach. Timid procedures such as bone drilling, application of metal plates, or other forms of internal fixation, etc., do not get to the heart of the problem and are an unnecessary multiplication of surgical procedures.

If it is decided that a surgical approach to the correction of a nonunion of a long bone is to be adopted, the method should be the most direct, positive, and certain of success. That method is bone grafting. The type of graft is of some importance, but any bone grafting procedure multiplies the probability of a good result. Even bone grafting performed immediately after the diagnosis of nonunion is not invariably successful and occasionally requires a repetition or two of the operation. Certainly the earlier the procedure is performed the more probably there will be a good result. Delay in operation results in further eburnation of the fragments at the fracture site requiring greater resections to get back to good live bone, greater production of surrounding and intervening scar tissue, increased atrophy of muscle and loss of tone, increased demineralization of the bones with decreased capacity to retain apparatus for internal fixation, and a generally increased apathy to the repair response. Therefore, as soon as a nonunion is diagnosed and the decision has been made to repair it surgically, the surgery should be promptly instituted.

Theoretically the reproduction of those conditions which are most conducive to the healing of any fresh fracture is the procedure which most probably will heal a nonunion. Since the normal repair of a fracture results principally from the production of anchoring and bridging calluses rather than from an intervening callus, surgical procedures are directed at their production. Scar is dissected away to allow fresh, vital, well vascularized tissue to come into contact with the grafts and the bone. Frequently in well aligned fractures the scar intervening between the bone ends is not dissected away as it is of more value as immobilization than it is a deterrent factor in healing.

A good residual hemorrhage about the operative

site is encouraged, as in a fresh fracture. By chiseling away the superficial layers of the cortex, fresh, active, alert bone-producing cells are exposed. Grafts composed of cortex plus layers of cancellous bone are applied to these freshly cultivated beds. Maintenance of close contact with minimal motion between the grafts and the shafts is essential because motion will break up newly produced healing tissue. Immobilization of the fracture is obligatory and frequently can be best achieved by internal fixation. Application of one or two bone plates or intramedullary fixation may be the stratagem which will instigate a favorable outcome for the operator.

As for the graft itself, there are three types, though only two are acceptable. The heterogenous grafts of cow horn, beef bone, ivory plates, etc., are properly relegated to the museum show case; in the past where they were used they functioned only as immobilizing plates and foreign bodies rather than possessing any osteogenetic value.

Almost without exception orthopedic surgeons now employ human bone grafts and prefer autogenous grafts freshly removed. Homogenous grafts, particularly since their easy availability from bone banks has been established, are on occasion of inestimable value in the treatment of nonunions. The bone bank may be the source of grafts of proper magnitude or shape not available from the patient at the time of operation. However, there is a considerable difference of opinion among recognized authorities as to the efficacy of homogenous grafts in the treatment of nonunion when compared to autogenous grafts. Probably the burden of proof lies with those who claim homogenous grafts are equal or superior to autogenous. My personal opinion is that fresh autogenous grafts are definitely more efficacious than homogenous grafts and offer every advantage of homogenous grafts, with some additional advantages not offered by homogenous grafts.

When considering what type of graft to use there is no question but that cancellous bone offers osteogenetic advantages cortical bone does not possess. Cancellous bone is rich in endosteal cells which are those most likely to survive and which have great osteogenetic potential. Also, cancellous bone grafts offer myriads of channels for invasion of capillaries from the host, while cortical bone is sparsely equipped with areas for this essential vascular invasion. This lack of vulnerability to vascular invasion retards the early, rapid conversion of the cortical graft to vital bone.

Another factor which works against the efficacy of the cortical graft is the means by which it is ordinarily secured. Cortical grafts are usually cut by a rapidly revolving saw which produces so much heat in its action that it not only kills the cells for a con-

siderable distance on each side of the cut but effectively blocks the few channels available for cellular invasion by coagulating the proteins within them. These coagulated proteins must be absorbed before these channels are available for capillary invasion.

On the other hand, cancellous bone is ordinarily obtained by chisel or curet; thus the tissue damage is minimal, and when these grafts are placed in the host bed they carry many live cells eager to unite with those of the host. Cancellous grafts can be obtained easily from the ilium.

In our practice, because of their actual statistical as well as theoretical superiority, we have almost completely discarded cortical grafts and now use only cancellous grafts in the treatment of nonunion. The thin cortex of the ilium functions as the vehicle which transports the osteogenetic cancellous bone on its under surface. The cortex also gives body and firmness to the graft which facilitates its handling; and it offers a firm surface through which coapting force can be applied to the graft. The thickness of the cancellous graft can be varied to accommodate the requirements of the operation. The conditions we attempt to

secure in the bone grafting of a nonunion of a long bone are:

Adequate alignment and contact.

Strong internal fixation.

Good fresh host bed.

Firm contact of cancellous grafts.

Apposition of well vascularized soft tissue to the grafts.

When these conditions are met, there is a high percentage of good results in bone grafting cases of nonunion.

There are occasional situations where nonunion is of little moment and may be of so little significance that it does not invite surgical correction. Occasionally nonunions of the fibular shaft, clavicle, metacarpal, phalanx, olecranon, patella, humerus, and ulna can be accepted as either symptomless or insignificantly disabling. The mere presence of a nonunion does not imply the necessity of treatment. The decision of "to do or not to do" must be based on the factors previously predicated in the introduction.

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Purpura

Some Observations on the Clinical Aspects of Thrombocytopenic Purpura

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INTRODUCTION

Thrombocytopenic purpura has long been an interesting and confusing disease. For many years discussions have included the lack of correlation between the apparent bleeding tendency in thrombocytopenic purpura and the numerical platelet level in the peripheral blood. There is quite frequently a discrepancy in these two features of the disease, so there is not a direct quantitative platelet deficit.

Some observations¹ since the advent of the use of corticotrophin and cortisone in the treatment of these disorders stimulate further interest in whether these compounds may alter the apparent hemorrhagic tendency without altering the numerical platelet count. The purpose of this report is not to present any particular new views but to call attention to some of the interesting work in this field and to relate our experience in treating this disease with corticotrophin and cortisone.

Among the various theories on the mechanism of production of thrombocytopenia, the intimate relationship of the spleen has long been recognized. Kaznelson² suggested that there was a thrombocytolytic effect manifest through a splenic mechanism. Wiseman, Doan, and Wilson³ proposed the theory of sequestration of platelets in the spleen or in accessory splenic tissue. Tidy⁴ blamed a vascular endothelial

Cortisone and related compounds have been used extensively in hematologic diseases including idiopathic thrombocytopenic purpura. A double defect of vascular fragility and numerical platelet deficiency has long been noted. Experiences with the favorable effect of cortisone on the first of these two defects, with little effect on the latter, is discussed. Prior theories regarding cause and mechanisms in this disease are presented.

¹From the Department of Internal Medicine, Wichita Clinic.

defect, stating that the platelets "leak out," or are utilized in sealing leaks in the endothelium. Robson⁵ suggests that a splenic factor might alter platelet production and capillary endothelium also.

In 1951, Evans et al.⁶ pointed out that idiopathic thrombocytopenic purpura was probably due to an immune mechanism similar to that of acquired hemolytic anemia. They called attention to the fact that these two conditions frequently occur in the same individual and that both of them might spontaneously undergo remission. Both apparently are amenable to splenectomy in some cases. Evans felt that this similarity was probably explained by antigen-antibody mechanisms rather than by the theory that splenectomy removed the "slaughter house" of the cellular elements. He also suggested new terms for these diseases, namely "immuno-hemolytic anemia," "immuno-thrombocytopenic purpura," and "immunopancytopenia."

The work of Herrington et al.⁷ and Sprague et al.⁸ in the demonstration of a thrombocytopenic factor in the blood of patients with thrombocytopenic purpura is now well documented. They demonstrated that a potent circulating thrombocytopenic factor was important in platelet reduction in many cases of idiopathic thrombocytopenic purpura. They also pointed out similarities in the apparent pathogenesis of acquired hemolytic anemia and idiopathic thrombocytopenic purpura.

Stefanini et al.⁹ still mention Dameshek's view that the spleen exerts a humoral effect on platelets and megakaryocytes. A large amount of work has been done in the field of immuno-hematology in an effort to make more clear the views in these various disorders.

One feature, still unexplained, is the apparent double defect of vascular fragility and numerical deficiency of platelets. Stefanini and Dameshek¹ state that increased capillary fragility and increased bleeding time suggest direct damage to the capillary wall in many cases. Bleeding may stop spontaneously although platelets may remain low in numbers. They relate that "several workers have shown" that ACTH and cortisone alter idiopathic thrombocytopenic purpura by influencing the vascular defect more than platelet production.

Robson and Duthie⁵ reported prompt increase of capillary and vascular resistance following ACTH in two cases of idiopathic thrombocytopenic purpura. The platelet rise was small and delayed. Green et al.¹⁰ reported irregular correction of platelet numerical deficit but regular improvement of vascular fragility following the use of ACTH. This has been our experience.

The finding of inactive megakaryocytes in the marrow of idiopathic thrombocytopenic purpura has been

a problem to explain. It would seem reasonable that the megakaryocyte, with its cytoplasmic projections, is antigenically identical to the platelet, and the projections may be "agglutinated-off" by circulating antibody. The capillary endothelium, or whatever is responsible for its integrity, might also be involved with some antigenic mechanism.

Ackroyd's work^{11, 12, 13} with Sedormid purpura mechanisms is interesting in this regard. He demonstrated that Sedormid activates a thrombocytolytic mechanism in the plasma of sensitive patients. Sedormid did not destroy normal platelets, or platelets of a sensitive person, if they were suspended in normal plasma; it destroyed both groups of platelets when added to suspensions of them in plasma of a sensitive patient. Sedormid placed on the skin of a sensitive person causes localized capillary fragility as evidenced by localized occurrence of petechiae. Ackroyd suggests that the capillary lesion of Sedormid purpura could be due to the same lytic mechanism acting on capillary endothelium on a systemic basis.

CASE 1

A 55-year-old female gave a 30-year history of intermittent bleeding tendency manifest by bleeding from the gums and kidneys, with petechiae and ecchymoses. She had had many spontaneous remissions. In the past three years she has had numerous courses of cortisone (100 to 200 mgms. per day in divided doses) with prompt regression of clinical bleeding tendency, but with very poor platelet numerical response. Splenectomy has been repeatedly advised but declined by the patient.

CASE 2

A 44-year-old female four years previously had had a period of spontaneous bruising which cleared without therapy. She had previously been treated with "gold injections" for a six-month period. In 1954 she had a hysterectomy for relief of menorrhagia caused by uterine fibroids. In the postoperative period she developed a large pelvic hematoma. Her platelets were approximately 10,000 per cubic millimeter early in 1955. Bone marrow aspiration revealed normal numbers of megakaryocytes with little granularity and no platelet production. Gold toxicity was excluded by the presence of megakaryocytes and the normal appearance of other marrow elements.

She was treated with cortisone, 100 to 200 mgms. per day in divided doses, and the bruising tendency cleared promptly, as did the Rumpel-Leede test. After five months on maintenance therapy of approximately 75 mgm. of cortisone daily, the platelet count had still failed to rise above the peak level of 32,000 per cubic millimeter.

CASE 3

A 57-year-old female had onset in October 1953 of a bruising tendency with petechiae, hemoptysis, and gross hematuria. Platelets were rare on stained blood films, and platelet counts varied between 2,000 and 17,000 per cubic millimeter. Cortisone, 100 mgms. per day brought a prompt cessation of bleeding and reversed the Rumpel-Leede test from positive to negative. When the dosage was reduced or omitted, the patient relapsed. Relapses occurred four times in the following 16 months. The highest platelet count at any time has been 30,000 per cubic millimeter. Splenectomy has been advised but declined, as the patient feels reassured by her consistent response to cortisone.

CASE 4

A 58-year-old female had bruises and petechiae 17 years ago with a spontaneous remission. Recent recurrence had been noted. Cortisone, 100 to 200 mgm. per day, resulted in prompt clearing of bruises and petechiae. Platelets failed to raise above 58,000 per cubic millimeter in a seven-day observation period.

In none of these cases was there actually a good platelet response. Perhaps the dosage of cortisone should have been higher, but, disregarding this factor, it was apparent that the capillary fragility was favorably influenced by this dosage. It is contemplated that higher dosage will be employed in some future cases in an effort to evaluate the dosage factor.

CASE 5

A 10-year-old male gave a one-day history of petechiae and acute bleeding symptoms. His platelets numbered 6,000. He was in the hospital for 15 days, receiving cortisone, 50 to 100 mgm., daily. Bleeding manifestations subsided promptly, and he was sent home on a 50 mgm. maintenance dosage with a platelet count of 192,000. Cortisone was gradually reduced to 25 mgm. per day in divided dosage, and after one month at home on this dosage the petechiae reappeared. The platelet count was found to be 30,000 at that time. After another month on increased dosage, the dosage was again reduced and the platelets fell to 60,000 but bleeding symptoms did not recur.

No further cortisone was given after that time. One year after the acute illness the platelet count was 162,000 per cubic millimeter, and the patient has no clinical signs of bleeding.

This latter case represents one of a few in our experience in which platelets would rise as well and as promptly as the bleeding tendency decreased. It would appear that the platelet count and bleeding could almost be "titrated" by the use of steroid therapy. This has been our experience in a case of acquired hemo-

lytic anemia, where the patient's erythrocyte count and hemoglobin, as well as the reticulocyte count, could be directly and constantly influenced by raising or lowering cortisone dosage. These observations tend to support the belief that cortisone alters an antigen-antibody type of reaction. The fact that some patients remain well as cortisone is withdrawn might be due to removal of the antigenic stimulus or the antibody response in some unknown manner. The double defect in idiopathic thrombocytopenic purpura remains unexplained.

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Alseroxylon

A Study of the Psychological Effects of the Drug

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During the past 18 months we have noticed considerable improvement in the feeling of well being of patients treated for hypertension with Rauwolfia serpentina (Rauwiloid*) long before there was any change in blood pressure. The following study was set up, using patients of a young age group, because we felt they would benefit from the drug.

We were interested in determining if there was any contraindication which could be decided by psychological tests in the use of this drug. For example: Was anxiety actually diminished in these patients? Were there any adverse effects on judgment, or on the patient's efficiency on the job? If so, what were the changes that did occur? In order to answer these questions the study was set up. Nine patients from a general clinic were selected for psychometric study before and after administration of Rauwiloid.

PATIENTS IN STUDY

Case 1, a white male 37 years old, was admitted because of bronchial asthma. Blood pressure was 124/80. Rhonchi were heard throughout lung fields. Because of severe anxiety, the patient was placed in the pilot study. After 30 days of therapy the patient's symptoms had improved.

Case 2, a white male 48 years of age, was admitted to the hospital for hypertension and arteriosclerotic heart disease. Blood pressure was 176/110. He was known to have had elevated blood pressure since 1946. An electrocardiogram showed left bundle branch block. Because of his anxiety over his heart, this patient was placed in the pilot study. After 30 days his blood pressure was 150/80, but the symptoms were only questionably improved.

Case 3, a white male 31 years old, was admitted to the hospital with a history of blood pressure being elevated during excitement since the age of 13. Initial blood pressure was 142/86. He was placed in the pilot study because of the history of labile hypertension. After 30 days, this patient stated he felt more relaxed, was not so excitable, and his symptoms were improved.

Case 4, a white male 29 years old, was admitted to the hospital with a history of bronchial asthma. Because of anxiety manifest by indigestion and fatigue, the patient was placed in the pilot study. After 30 days the patient's indigestion was improved and there was less fatigue.

Case 5, a white male 39 years old, was admitted to the hospital because of acute chest pain and episodes of shortness of breath with chest distress. Blood pressure was 134/74. He was submitted for pilot study because of marked anxiety, manifested by hyperventilation. After 30 days he felt improved. There was much less anxiety.

Case 6, a white male 34 years old, was admitted to the hospital because of indigestion and tachycardia. Chronic duodenal ulcer and mild elevation of systolic pressure to 156/86 were found. The patient complained of nervousness and insomnia. After 30 days on therapy his symptoms seemed improved.

Case 7, a white female 32 years old, was admitted to the hospital because of shortness of breath and cardiac irregularity. The findings were premature ventricular contractions and anxiety manifested by hyperventilation. After 30 days on Rauwiloid there was marked improvement of symptoms.

Case 8, a white male 20 years old, had been followed in the outpatient clinic by the local physician for 18 months. He had dyspnea, chest pains, and tachycardia on exertion. Blood pressure readings varied from 120/80 to 190/100. He was working and living under stress. He was symptomatically improved after 30 days.

Mr. Wright is a clinical psychologist on the Neuropsychiatric Service, Dr. Pokorny is from the Department of Internal Medicine, and Dr. Foster is chief of the Neuropsychiatric Department, Hertzler Research Foundation, Halstead Hospital, and Hertzler Clinic, Halstead.

* Supplied by Riker Laboratories, Los Angeles.

Case 9, a colored male 25 years old, was admitted to the hospital because of borderline hypertension and pain through the chest and back. Blood pressure was 150/90, and he gave a history of elevated blood pressure for the preceding seven years. He was placed in the study because of mild hypertension. After 30 days there was no improvement of symptoms.

TESTS EMPLOYED

The test battery included the Wechsler-Bellevue forms I and II, Rorschach Ink Blot Test, and the Reaction Time Test. Comparison of the results in this battery of tests given before and after 30 days administration of Rauwiloid, 2 mg. given three times daily, permits, within the limitations imposed by the small number of patients, the psychological tests used, and the experimental design, several inferences to be made regarding the effects of this drug.

RESULTS OF TESTS

Effects revealed in the area of intellectual functioning are as follows: All nine patients included in the experimental group showed an average gain of 17 per cent in efficiency of recall. Six of the nine subjects included showed an average improvement of efficiency in judgment and comprehension of 10 per cent, while three of the subjects manifested an average of 8 per cent loss in efficiency of this function.

Four of the nine subjects reflected an average improvement in efficiency of attention of 12 per cent, while three subjects suffered a loss in efficiency averaging 8 per cent, and two subjects showed no change.

Six of the nine subjects exhibited an average gain of efficiency in concentration of 14 per cent, while three of the subjects showed an average loss of 18 per cent in efficiency.

Seven of the nine subjects manifested an average improvement in efficiency of thinking in abstract terms of 14 per cent, while two suffered a loss of efficiency in this area averaging 14 per cent.

Eight of the subjects demonstrated an average improvement in social adjustment and planning of 22 per cent, with one patient showing a loss of 8 per cent in this adjustment.

Seven of the nine subjects demonstrated an average improvement in social adjustment and planning of 22 per cent, with one patient showing a loss of 8 per cent.

Seven of the nine subjects manifested an increase in alertness to surroundings averaging 10 per cent, while two of the subjects demonstrated an average of 10 per cent loss in this area.

All nine of the subjects manifested an average gain in efficiency of achievement on visual-motor tests of a reproductive type of 11 per cent. Eight subjects

reflected an average gain in efficiency of achievement on visual-motor tests of a productive type of 10 per cent, with one subject suffering a loss of 1 per cent in this type of activity.

Five achieved an average increase in efficiency of learning new material and psychomotor speed of 6 per cent, while four suffered an average of 3 per cent loss in such activity.

Six subjects showed a statistically significant gain in verbal I.Q. of 3.67 points, while two of the subjects suffered a loss averaging 7 points. One subject showed no significant change. All nine of the subjects achieved an average gain in performance scale I.Q. of 7 points that was statistically significant. Seven of the nine subjects demonstrated an average gain in Full-Scale I.Q. of 5 points, while one suffered a loss in total Full-Scale I.Q. of 5 points and one showed no significant change.

Results of the Reaction Time Test reveal that none of the nine subjects suffered increased reaction time, and only two of the subjects demonstrated statistically significant improvement in reaction time.

Examination of personality and emotional organization reveals that although minor changes were rarely found in the various facets of emotional organization and personality structure of the nine subjects, significant and marked reduction in anxiety resulted in all nine cases. One of the nine was diagnosed as having a schizoid personality disorder (without classical symptoms of delusions and hallucinations). Psychological examination revealed that although significant reduction in anxiety occurred after he was on this medication, the malignant process of schizoid disorganization continued to progress.

Examination of possible changes in degree and mode of control with which the subject tries to regulate his emotional experiences and reactions revealed that four of the nine demonstrated some improvement in this area, three showed no change, and two became more inefficient. In most cases demonstrating improvement, such improvement consisted either of "letting up" on over-control or constrictive control over emotional life, making way for a wider range and greater depth of emotional experience, or by more efficient control over impulsiveness. Those with impairment showed a noticeable increase in over-control in one instance and an increase in impulsiveness in the other.

Examination for changes in responsiveness to external emotional stimuli and promptings from within reflects that three of the nine manifested improvement in this area, five showed no change, and one became more inefficient. Those showing improvement did so by consequently exercising more effective and less strenuous control over emotional life, making way for broader emotional experiences which were

at the same time within conventional limits. They were also able to accept their inner impulses to a much greater degree.

Examination for possible changes in mental approach to given problems and situations reveals that in six of the nine there was noticeable improvement in efficiency in this area; two showed no change, and one showed increased impairment. Those patients whose efficiency increased demonstrated more efficient use of their capacity for analyzing a situation into its parts and in integrating the parts into a meaningful whole. Patients showing impairment or no change exhibited an increase or persistence in their tendency to perceive problems either in terms of vague generalities or to be over-meticulous, seeing small, insignificant details but missing the over-all or total significance of the problem.

Examination for possible changes in creative and imaginative capacities reflects that two of the nine manifested improvement in this area. Such improvement appeared to result from reduced anxiety and conflict, which allowed for more energy to be turned in this direction. Clinically such improvement might be revealed through more initiative and originality in the various aspects of living. The other subjects showed no significant change.

Examination for possible changes in the type of defense mechanism relied upon reveals that none of the nine showed significant change.

It is interesting to note that eight of the nine were relying essentially upon various psychoneurotic mechanisms of defense in varying degrees from the psychoneurotic to the so-called normal. Of these eight patients, four relied less heavily upon their defenses in reaction to decreased anxiety. The other four of the eight showed no change in degree of reliance upon these defenses and represented those classed as bordering upon or well within the psychoneurotic adjustments. The one remaining patient showed an increase in reliance upon his chief defense mechanisms, and it was noted that this patient's adjustment was diagnosed as a schizoid personality disorder (without classical symptoms of delusions or hallucinations), i.e., this patient continued to go down-hill in his adjustment in spite of the fact that he experienced less discomfort from anxiety.

Evaluation of test data for those signs usually found in cases of intracranial damage, organic change, and postoperative lobotomy cases was negative in all cases.

CONCLUSIONS AND DISCUSSION

It may be inferred within the limits of this study that most patients placed on Rauwiloid, 2 mg. given three times daily for a 30-day period, achieved a marked reduction of anxiety. Further, that such relief from anxiety resulted in generally increased intellec-

tual and psychomotor efficiency with a few exceptions. No adverse effects resulted in any of the psychological aspects or in reaction-time that could be attributed to the effects of Rauwiloid. Psychological examination for organic changes and postoperative prefrontal lobotomy effects was negative in all cases.

On the basis of the findings of this study, it may be inferred that reduction of anxiety in all cases represented symptomatic relief from anxiety rather than etiological treatment of anxiety. This would seem to indicate that great care should be exercised in evaluating and diagnosing the etiology and depth of pathology underlying anxiety in a patient prior to the administration of this drug. It seems plausible that an individual suffering from an incipient and/or malignant personality disorder might easily delay seeking psychiatric help by virtue of the pseudo-relief from anxiety offered by this drug in such cases.

It cannot be inferred that increases in I.Q. points manifested by these patients while on this drug represent increased intellectual capacity. Such increases undoubtedly reflect increased intellectual efficiency resulting from being freed from the paralyzing and blocking effects of anxiety. In those few patients manifesting loss of efficiency in certain areas after being on this drug, it would be difficult to ascertain whether such losses resulted from the effect of the drug on certain types of personalities or from the inability of the drug to reduce anxiety in certain specific personality types, thereby allowing for a continuation of the progressive inefficiency.

Further investigation on the psychological effects of Rauwiloid seems appropriate. Different results might be obtained, especially with regard to the possibility of personality and/or organic changes and the disputable "lobotomy effect" mentioned by some investigators, after the subjects have been on this drug for a longer period of time and/or if placed on a higher dosage of medication.

Further study including a control group placed on placebos might furnish valuable information on the psychological effects of Rauwiloid. A study based on a larger sample of patients could possibly result in determining types of personality disturbances for which this drug might be indicated or contraindicated.

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** The rationale and technic of the tests used were derived from the textbooks listed.

Cerebral Palsy

The Physical, Psychological, and Speech Status of Children Seen in the University of Kansas Medical Center Clinic

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Cerebral palsy includes any neuromuscular disturbance resulting from pathology in the motor areas of the brain. Manifestations are spasticity, rigidity, paralysis, involuntary motions, tremor, and ataxia; one of these usually predominates. Causes may be congenital malformations of the brain, anoxia, birth trauma, infection, or accident after birth.

Few patients present themselves simply as orthopedic or neurological problems. Mental retardation, speech difficulties, seizures, emotional problems, defective dentition, feeding problems, hearing disturbances, and visual problems are present in large numbers. Some cerebral palsied children are able to attend public school without special consideration; others are more severely handicapped and exhibit limited potential for improvement; most, however, can profit from prescribed therapies, special education, or both.

The cerebral palsied child may become a tremendous physical and psychological burden on the family and, later, a custodial problem for the state. Treatment and special education are expensive, and facilities are limited. Therefore, it is important to evaluate these children early and plan for their treatment and rehabilitation, or care. It is our belief that this is done best by an initial thorough evaluation and regular follow-up studies.

The number of new cases appears relatively steady through the years, and they are fairly evenly distributed throughout the population. For about every 568 live births, one child is born with cerebral palsy. From live birth statistics, it is estimated that 88 cerebral palsied children were born in the state of Kansas

during the year 1952. For every 20 children "born that way," one person will become cerebral palsied after birth as a result of accident or illness.³

The Cerebral Palsy Clinic at the University of Kansas Medical Center utilizes a team diagnostic and treatment approach. The present diagnostic team includes an orthopedic surgeon, who is the coordinator;

This is a report of 240 children evaluated at the Cerebral Palsy Clinic at the University of Kansas Medical Center, 1951-1955. The various manifestations of this condition are described, along with the manner in which patients are studied and an estimate of the probable benefit of additional education and treatment.

a neurologist, a pediatrician, an ophthalmologist, a dentist, a psychologist, an audiologist, an occupational therapist, a speech therapist, a physical therapist, and a social service worker. Children are admitted to the hospital for a period of three days for the initial evaluation. Each member of the team examines the child and presents his findings to the group. Referrals to other clinics within the Medical Center are made when necessary before a program of therapy is planned for the child.

Therapy programs are worked out for each child. Children who live within traveling distance of the

Medical Center are given comprehensive treatment. Because the assistance of trained therapists often is not available locally in small communities, however, the parents in many cases must carry out the therapies that are recommended. Counselling and planning concerning both long term and short term goals are offered to all parents. One of the great problems is to secure the acceptance of the family of the child's mental as well as physical limitations.

PHYSICAL STATUS

From November, 1951, when the Cerebral Palsy Clinic was organized, to August, 1955, 240 children between the ages of six months and 19 years were evaluated. Table I shows the distribution by age and sex. It will be seen that 140 were males and 100 were females. For both sexes, children between six months and seven years made up the majority of the group. More than 90 per cent of the cases were seen before they were 15 years old.

TABLE I
AGE GROUPS
(As of August 1, 1955)

	Boys	Girls	Total
6 months to 7 years	67	72	139
8 years to 14 years	60	20	80
15 years to 21 years	13	8	21
	140	100	240

Table II shows a breakdown of diagnoses for the group. Some of our diagnoses have changed with continued observation and growth. The basic pattern is more difficult to determine in infants, but early observations are helpful. The table shows the distribution of the latest diagnoses that were made.

It will be observed that 62 per cent were spastic, 13 per cent athetoid, 2.5 per cent rigidity, 1.8 per cent ataxic, .8 per cent tremor, 7 per cent mixed, and 12 per cent were classified as generalized brain damage. This organization follows the traditional classifications. It must be remembered, however, that these are all descriptive and not neuropathologic terms.

Nevertheless, certain syndromes and patterns are common. Perlstein² reported the relationship between etiological agents and specific syndromes. Spastics in general are more likely to have had a history of factors causing hemorrhage. Spastic paraplegics usually have a history of prematurity; behaviorally they are likely to show less mental retardation and fewer speech problems than other cerebral palsied groups. Athetoids are likely to have a history of factors causing anoxia or an Rh disturbance. They are more likely to be quadriplegics and to have hearing losses. One

TABLE II
DIAGNOSES
(As of August 1, 1955)

	Boys	Girls	Total
<i>Spastic 62%</i>			
Right hemiplegia	25	15	40
Left hemiplegia	18	8	26
Paraplegia	17	18	35
Quadriplegia	26	16	42
Monoplegia	0	2	2
Diplegia	0	3	3
Bilateral hemiplegia	1	0	1
<i>Athetoid 13%</i>	26	6	32
<i>Rigidity 2.5%</i>	2	4	6
<i>Ataxia 1.8%</i>	1	2	3
<i>Tremor .8%</i>	1	1	2
<i>Mixed 7% (usually athetoid spastic)</i>	9	8	17
<i>Others 12%</i>			
Generalized brain injury ...	14	16	30
Birth palsy, not considered c.p.	0	1	1
	140	100	240

study¹ showed that 50 per cent of athetoids had hearing losses.

Diagnosis is not easy. Nevertheless, it is important to classify the patient as early as possible because educational problems and treatment routines differ.

PSYCHOLOGICAL STATUS

With children who are severely handicapped it is extremely difficult to obtain valid psychological test results. However, the success of therapy is so dependent upon the child's readiness and awareness that an attempt is made to obtain an estimate of his capabilities. Some children have been tested two or three times and will be tested again. Some will be re-evaluated because of uncertainty about the validity of earlier tests. Others will be re-examined to confirm mental growth rate. It is the aim of the clinic staff to evaluate continuously each child who is in the clinic.

One hundred eighty-seven of the 240 children have been evaluated by the psychologist during the study period. Of the 53 who have not been tested, 19 are getting along in public schools with little or no difficulty. They may safely be considered to have normal or near normal mentality. Fifteen children are so retarded that a psychological examination was considered unfeasible. Factors of age, severity of involve-

ment, uncooperativeness, and scheduling problems have interfered with the psychological testing program. All of the children, however, eventually will be scheduled for examinations.

Table III indicates the number of children who fall into each of the intellectual categories. Of those who have been tested, 71, or 37 per cent, appear educable in regular public school programs, but some may need additional help. About 35, or 18 per cent, will require special class or special school education. The educational process must be modified considerably because of the degree of mental retardation. Seventy-four, or 39 per cent, fall in the two lowest categories, imbecile and idiot level. These children will not profit from a school program, but the imbecile can profit greatly from systematic habit training. For seven children, or 4 per cent, the degree of mental retardation could not be determined because of age and uncooperativeness in the testing situation.

TABLE III

PSYCHOLOGICAL EVALUATION RESULTS
(As of August 1, 1955)

Breakdown of those tested:

	Boys	Girls	Total
Average or above	20	8	28
Dull normal	16	9	25
Borderline	11	7	18
Moron	21	14	35
Imbecile	27	23	50
Idiot	11	13	24
Mentally retarded—degree not known at present	4	3	7
	110	77	187
Breakdown of those not tested:			
Probably average or dull normal	11	8	19
Probably idiot or imbecile	9	6	15
Questionable	10	9	19
	30	23	53

SPEECH STATUS

About 70 per cent of all cerebral palsied children have speech or language problems.¹ Speech development of the cerebral palsied child is complicated by many factors. Mental capacity, degree of speech muscle involvement, visual and auditory disabilities, inability to explore the environment because of motor involvements, and motivation will determine when the cerebral palsied child will begin to talk and how much progress he will make.

Table IV shows the varying levels of speech de-

velopment for the 235 children who have been given speech evaluations in the Cerebral Palsy Clinic. It will be seen that only 45, or 19 per cent, had speech patterns that could be considered normal. Another 76, or 32 per cent, had limited or no oral communication and probably will not learn much conceptual language. It is apparent that for the other 49 per cent, speech stimulation or speech therapy is needed, if they are to achieve even a minimum of understandable oral communication.

TABLE IV
SPEECH DEVELOPMENT
(As of August 1, 1955)

	Boys	Girls	Total
Normal for chronological age	30	15	45
Inadequate communication for chronological age			
Mildly distorted articulation	14	14	28
Moderately distorted articulation	19	14	33
Severely distorted articulation ..	17	7	24
Stuttering	4	1	5
Language problem due to severe hearing loss	8	2	10
Gesture language	4	10	14
Limited or no concept of communication	41	35	76
No adequate speech evaluation	3	2	5
	140	100	240

CONCLUSIONS

1. Cerebral palsied children are multiple-handicapped persons with varying degrees of motor involvement, intelligence, and potential growth. Their major disability is a neuromuscular disturbance resulting from pathology of the motor areas of the brain.

2. The largest number of cases, 62 per cent, were classified as spastic. The other 38 per cent were distributed among athetoid, rigidity, ataxia, tremor, mixed, and less specific types.

3. According to psychological evaluations, approximately 37 per cent will get along in public school with some additional assistance; 18 per cent need to be in special classes or special schools, and 39 per cent are not going to profit from public school programs.

4. Speech evaluations indicated that 19 per cent of the children have speech within normal limits; 49 per cent need speech therapy, and 32 per cent probably will not develop speech.

University of Kansas Medical Center
Kansas City, Kansas

PRESIDENT'S PAGE

DEAR DOCTOR:

The following has been adopted by the Council of the Kansas Medical Society as an official statement of the policies of this organization:

The Hatch Act defines what is legal in political activity for federal legislation. It may be wise to follow similar principles with reference to state politics. Here are a few of the most important considerations as they affect medicine.

The medical society *can*

1. Support legislation if it will benefit the people, protect their health or provide them with an improved quality of medical care.
2. Actively oppose legislation that is not in the public interest.
3. Urge people to vote.

The medical society *cannot*

1. Endorse or oppose any candidate for office.
2. Contribute any funds in support of any candidate.
3. Use its letterheads or facilities to aid or defeat any candidate.
4. Sponsor any advertising for a candidate.

The individual physician *may*

1. Exercise all the rights of citizenship. This responsibility in health matters exceeds that of other citizens.
2. Further the cause of a qualified candidate or oppose an unqualified candidate.
3. Organize or belong to a political action committee, even if it exists expressly to aid or oppose a candidate or a single legislative issue.
4. Contribute to a candidate or a political party.
5. Advise friends about his views upon an issue or about a candidate.
6. Visit with the candidate concerning his views.
7. Distribute literature, purchase political advertisements, etc.
8. Himself become a candidate and run for office.
9. Vote and encourage others to vote.

The individual physician *may not*

1. Abuse a candidate, threaten violence, or make libelous statements concerning him.
2. Speak for his Society or use an office he might hold in the Society to make it appear he is a spokesman for organized medicine.

Fraternally,

Clyde H. Miller M.D.

President

EDITORIAL COMMENT

Code of Ethics

The Council on Constitution and By-Laws of the American Medical Association prepared and submitted to the House of Delegates at the recent Chicago meeting a completely revised and much abbreviated code of ethics. Instead of the present eight pages and 48 sections, the proposed new code would have a preamble and 10 sections. It is intended to embrace everything from the present code but to make it short enough that it may be framed and hung in the physician's office to match the oath of Hippocrates perhaps.

There was enough dissatisfaction over the proposed changes that the reference committee, of which Dr. L. S. Nelson of Kansas is a member, recommended against immediate action. The proposed new Ten Commandments in Medicine are to be publicized and discussed locally. The decision on whether the code of ethics shall be changed will then be made at the Seattle meeting of the A.M.A. House of Delegates in December of 1956. The JOURNAL is therefore printing the proposed code which, be it understood, is not now in operation. The Society will appreciate comments so that the Kansas delegates may be instructed on how to vote when this question arises for final decision. The exact wording of the proposed text follows:

These principles are intended to serve physicians, individually or collectively, as a guide to ethical conduct. They are not laws; rather they are standards by which a physician may determine the propriety of his own conduct. They are intended to aid physicians, in their relationships with patients, with colleagues, with members of allied professions and with the public, to maintain under God, as they have through the ages, the highest standards.

Section 1. The prime objective of the medical profession is to render service to humanity with full respect for both the dignity of man and the rights of patients. Physicians must merit the confidence of those entrusted to their care, rendering to each a full measure of service and devotion.

Section 2. Physicians should strive to improve medical knowledge and skill, and should make available the benefits of their professional attainments.

Section 3. A physician should not base his practice on an exclusive dogma or a sectarian system, nor should he associate voluntarily with those who indulge in such practices.

Section 4. The medical profession must be safeguarded against members deficient in moral character and professional competence. Physicians should observe all laws, uphold the dignity and honor of the

profession and accept its self-imposed disciplines. They should expose, without hesitation, illegal or unethical conduct of fellow members of the profession.

Section 5. Except in emergencies, a physician may choose whom he will serve. Having undertaken the care of a patient, the physician may not neglect him. Unless he has been discharged, he may discontinue his services only after having given adequate notice. He should not solicit patients.

Section 6. A physician should not dispose of his services under terms or conditions which will interfere with or impair the free and complete exercise of his independent medical judgment and skill or cause deterioration of the quality of medical care.

Section 7. In the practice of medicine a physician should limit the source of his professional income to medical services actually rendered by him to his patient.

Section 8. A physician should seek consultation in doubtful or difficult cases, upon request or when it appears that the quality of medical service may be enhanced thereby.

Section 9. Confidences entrusted to physicians or deficiencies observed in the disposition or character of patients, during the course of medical attendance, should not be revealed except as required by law or unless it becomes necessary in order to protect the health and welfare of the individual or the community.

Section 10. The responsibilities of the physician extend not only to the individual but also to society and demand his cooperation and participation in activities which have as their objective the improvement of the health and welfare of the individual and the community.

Hospital Accreditation

A special committee on hospital accreditation, of which Dr. George F. Gsell of Kansas is a member, reported its findings to the American Medical Association House of Delegates at the recent meeting in Chicago. These were approved by action of the House and now stand as recommendations to the Joint Commission on Accreditation of Hospitals.

It should be pointed out that this action by the A.M.A. cannot be binding upon the Joint Commission on Accreditation and that this report is only a suggested course of action for the commission. There is reason to believe, however, that it will be favorably received and that most if not all of the proposals will be adopted. Appearing below is the action taken by the House of Delegates which should shortly become noticeable to the local hospitals through-out this nation:

1. Accreditation of hospitals should be continued.

2. The Joint Commission should maintain its present organizational representation.

3. The Board of Trustees should report annually to the House of Delegates on the activities of the Joint Commission.

4. Physicians should be on the administrative bodies of hospitals.

5. General practice sections in hospitals should be encouraged.

6. Staff meetings required by the Joint Commission are acceptable, but attendance requirements should be set up locally and not by the Commission.

7. The Joint Commission should not concern itself with the number of hospital staffs to which a physician may belong.

8. The Joint Commission is not and should not be punitive.

9. The Joint Commission should publicize the method of appeal to hospitals that fail to receive accreditation.

10. Reports on surveys should be sent to both administrator and chief of staff of hospital.

11. Surveyors should be directly employed and supervised by the Joint Commission.

12. Surveyors should work with both administrator and staff.

13. New surveyors should receive better indoctrination.

14. Blue Cross and other associations should be requested not to suspend full benefits to non-accredited hospitals until those so requesting have been inspected.

15. The American Medical Association should conduct an educational campaign for doctors relative to the functions and operations of the Joint Commission.

16. The Committee also suggests that the American Medical Association and the American Hospital Association encourage educational meetings for hospital boards of trustees and administrators either on state or national levels to acquaint these bodies with the functions of accreditation.

17. This Committee asks to be discharged upon submission of this report to the House of Delegates.

The Committee recommends that the commissioners to the Joint Commission on Accreditation of Hospitals, appointed by the Board of Trustees of the American Medical Association, urge that Commission to study:

1. The problems of the exclusion from hospitals and arbitrary limitation of the hospital privileges of the general practitioner, and

2. Methods whereby the following stated principles may be achieved:

The privileges of each member of the medical staff

shall be determined on the basis of professional qualifications and demonstrated ability.

Personnel of each service or department shall be qualified by training and demonstrated competence, and shall be granted privileges commensurate with their individual abilities.

Flying Physicians Meet

The first "fly-in" for members of the Kansas Chapter of the Flying Physicians Association was held at Hutchinson on May 27, beginning with a breakfast. Threatening weather discouraged attendance, but six physician pilots made the trip.

Three of those present, Dr. Robert O. Brown of Atchison, Dr. Louis N. Speer of Ottawa, and Dr. Lyle G. Glenn of Protection, made plans to attend the national meeting in Chicago on June 11. The program there included discussion of "Responsibilities in Maintaining Privately-Owned Aircraft" by a Civil Aeronautics Administration spokesman, "Weather Hazards to Flying" by a meteorologist of the Chicago Airport, "Trends of Aviation Underwriting" by an insurance expert, and "Purposely Crashing Aircraft" by Col. Roscoe Turner.

The next meeting of the Kansas group was held on Thursday, June 28, at Norton. The program included golfing and a tour of the Kansas State Tuberculosis Sanatorium. Plans are being made for a round robin trip over the state, a flight to Grand Lake in Oklahoma and to Flippin, Arkansas, and a picnic at Lake Kanapolis.

Heart Association Meets

Dr. D. R. Bedford, Topeka, was named president of the Kansas Heart Association at the group's annual meeting in Kansas City on May 27. He succeeds Dr. George L. Norris, Winfield. Dr. Don C. Wakeman, Topeka, was elected vice-president.

A feature of the meeting was the presentation of a bronze plaque to Dr. Philip W. Morgan, Emporia, in recognition of his services to the organization.

Literature on Alcoholism Available

A comprehensive index and abstract of the world's literature on alcoholism is now available at the library of the University of Kansas Medical Center. The data was published by the Yale Center of Alcohol Studies, and the title of the work is *Classified Abstract Archive of Alcohol Literature*.

A mimeographed list of the main topics and sub-topics is available from the Kansas State Commission on Alcoholism, 315 West Fourth Street, Topeka.



What Doctors Read

There are many factors involved in editing and publishing a state medical journal. Foremost among them is to find out what kind of articles physicians like to read. State medical journals have a captive audience, that is to say, their readers do not have to subscribe to the journal and in a sense, they take what they get. This is not the same as subscribing and paying money directly to receive a periodical. In the latter case, if a subscriber is not interested in the material published he can cancel his subscription or, if the contents of the journal is consistently attractive, the number of subscribers will increase. Of course, a reader of a medical journal may write to the editors to say that he likes or dislikes the journal contents but this rarely happens and only once in a while is there knowledge of the popularity of a published contribution.—*Connecticut State Medical Journal*, June 1956.

Authors, Hear Ye!

Clichés in medical writing have received the gibes of our readers for years. Of all the words which are used and abused, ad nauseam, is the word "marked"; even more inane is its running mate "markedly."

Distraught colleagues sharing editorial responsibilities of state medical journals plead in self-defense against these two words. One editor offers a list of synonyms, together with a prayer that they will be used again and again until finally in the future the clichés "marked" and "markedly" will never be heard again: "Great, copious, abundant, large, tangible, evident, perceptible, clear, unmistakable, decided,

pronounced, distinct, appreciable, extreme, noticeable, prominent, conspicuous, outstanding, salient, and others."

With so many good words from which to choose, what sort of mental laziness has victimized those who express definite findings, signs, and symptoms by only one poor and senseless word? It is almost as absurd as the more generally abused term "by and large." Definition of the latter should defy the imagination of the most imaginative among writers and speakers. We would like to join our fellow editor in stating, "Let us take our hats off to the wag who suggests that what the world needs is not only a good five-cent cigar, but a set of new clichés as well."—*Rocky Mountain Medical Journal*, June 1956.

Advice to Young Writers

In promulgating esoteric cogitations and articulating superficial sentimentalities, philosophical and psychological observations, beware of platitudinous ponderosity, jejune babblement and asinine affectations. Let your extemporaneous discantings and unpremeditated expiations have intelligibility and vivacity without thrasonical bombast. Sedulously avoid all polysyllabic propensity, psittaceous vacuity and ventriloquial verbosity. Shun double-entendre, imprudent jocosity, and pestiferous polluting profanity either obscure or apparent. Don't call names or use big words, but talk plainly, sensibly and truthfully. All of which is mindful of Disraeli's philippic for Gladstone: "He was a sophisticated rhetorician inebriated by the exuberance of his own verbosity."—*Quoted in Science*, June 11, 1954 via *Armed Forces M. J.*, October 1955.

Clinicopathological Conference

Chest Pain and Sudden Death in a Hypertensive Woman

CASE PRESENTATION

This 40-year old white female, whose chief complaints had been chest pain, abdominal pain, dizziness, and "blackouts," had never been admitted to KUMC. An autopsy was performed at the request of the coroner.

The patient had been known to be hypertensive for approximately five years, but diagnostic studies at the time of discovery of the hypertension failed to reveal an etiology. She was seen by many physicians and received numerous antihypertensive drugs without notable improvement. Two weeks before death she consulted an internist and complained of severe, intermittent, non-radiating substernal pain and dyspnea upon exertion.

Her blood pressure was 280/130. Cardiac fluoroscopy revealed an enlarged heart, predominantly in the left ventricular salient. An electrocardiogram was taken. She responded poorly to therapy with nitroglycerin, phenobarbital, and various other barbiturates. Initially she refused advice to enter a hospital, but 11 days before death was admitted to a local hospital. She complained of severe substernal pain, dyspnea on exertion, left upper quadrant and suprapubic abdominal pain, dizziness, and episodes of fainting of three days duration. During this period her feet had been swollen. She also complained of recurring headaches and blurred vision.

The patient stated that she had had 75 radium treatments for a carcinoma of the uterus 11 years before her admission to the hospital. The ovaries and tubes had been removed prior to this. There was no history of diabetes or kidney disease.

The patient's father had been hypertensive and had died of a heart attack. She had no children.

Physical examination revealed a slightly obese, apprehensive, white female with a blood pressure of 228/140. Pulse was regular and rhythmical, and the rate was 92. A grade II hypertensive retinopathy was noted. The point of maximal cardiac impulse was in the fifth left intercostal space, 2 cm. to the left of the mid-clavicular line. The second aortic sound was louder than the second pulmonic sound. No murmurs were heard. The liver was palpable 3 cm. below the

costal margin. Slight dullness was noted at the bases of both lungs, but no rales were present. The abdomen was not tender. All pulses were easily palpated. During the examination the patient, after a "premonition," fell to the floor for a brief period of time. This episode was not further described.

The patient remained in the hospital less than 24 hours, during which time she exhibited abnormal behavior characterized by suspicion of all hospital attendants and the expression of paranoid ideas about the nurses and her husband. She became upset when her husband was not allowed to remain at her bedside. She was discharged against medical advice before any laboratory or diagnostic studies could be done. The clinical impression was that she was suffering from a severe anxiety reaction and was possibly a paranoid schizophrenic. Several hours before death she complained of severe substernal pain during the night. Later she was found dead.

CLINICAL DISCUSSION

Dr. Delp (moderator): Today we have an unusual type of case. There is no clinical history, no physical examination, no laboratory work, and no one available who has ever seen the patient alive. The only history we have was secured by the pathologist, and Dr. Klionsky will present that.

Dr. Bernard Klionsky (resident pathologist): The history, as you have been told, is meager. The patient was not seen at this hospital, and the autopsy was done at the request of the coroner. We were told that this patient, a 40-year old white woman, had had hypertension for at least five years. We have no information about her actual blood pressure levels. Diagnostic studies are reported to have been done, but they failed to reveal the cause of her hypertension. She had seen a number of physicians and had received therapy of many types without material benefit.

About 14 days before death she consulted a local internist and complained of dyspnea and severe pain in the chest. He treated her with meperidine hypodermically and oxygen inhalations. He thought that she was having an acute coronary occlusion at that time. He made an electrocardiogram and fluoroscoped her, seeing nothing but enlargement of the left ventricle. He advised her to go to the hospital immediately, but she refused. Three days later at 10:00 P.M. he received a telephone call from the patient's husband who said that she had, in addition to the symp-

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

toms already described, some additional pain in the back. She went immediately to a local hospital. A brief history was obtained and physical examination was made by the intern about midnight. The patient signed out against advice about 7 o'clock the next morning. Consequently, no laboratory work was done. The complaints at that time were pain in the chest and back and a history of blacking out or fainting spells. As stated in the protocol, several hours before death, during the night, she complained of severe pain, and later was found dead.

Dr. Delp: Are there any questions?

Marvin Liggett (fourth year medical student):* I wonder if you could tell us where the diagnostic studies were done five years ago and how extensive they were?

Dr. Delp: They were done at Bethesda Naval Hospital.

Mr. Liggett: Was a pelvic examination done?

Dr. Klionsky: A pelvic was not done by any of the people who saw this patient in the last two weeks of life. The referring physician stated he could not do a pelvic because the patient was too ill.

Mary Howbert (fourth year medical student): Do you know anything about the circumstances of where

the body was found? Was she in bed, in a chair, or outdoors?

Dr. Klionsky: I do not know.

Mrs. Howbert: Did she have any fever while in the hospital?

Dr. Klionsky: None was recorded.

Mrs. Howbert: What medications did she receive in the hospital?

Dr. Klionsky: While in the hospital she had chloral hydrate. She was taking, on her own initiative, "tuinal," secobarbital, and pentaerythritol tetranitrate, apparently in fairly large doses, but without much effect on the pain. Her referring physician had given her meperidine.

Mrs. Howbert: Was this pain constant or intermittent?

Dr. Delp: I think we may assume from the comments made that it was fairly constant.

Alice Kitchen (fourth year medical student): Had this patient any kind of cardio-respiratory symptoms prior to two weeks ago?

Dr. Klionsky: I do not know.

Phillip Godwin (fourth year medical student): I get the impression that the patient was up and about at the time she came to the doctor. Is that correct?

Dr. Klionsky: Yes.

Dr. Delp: The patient was up and about all the time, even while she was in the hospital.

Dr. Frank A. Mantz, Jr. (pathologist): I would

* Though a medical student in May, 1955, when this conference occurred, he, like the others referred to as students, received the M.D. degree in June, 1955.

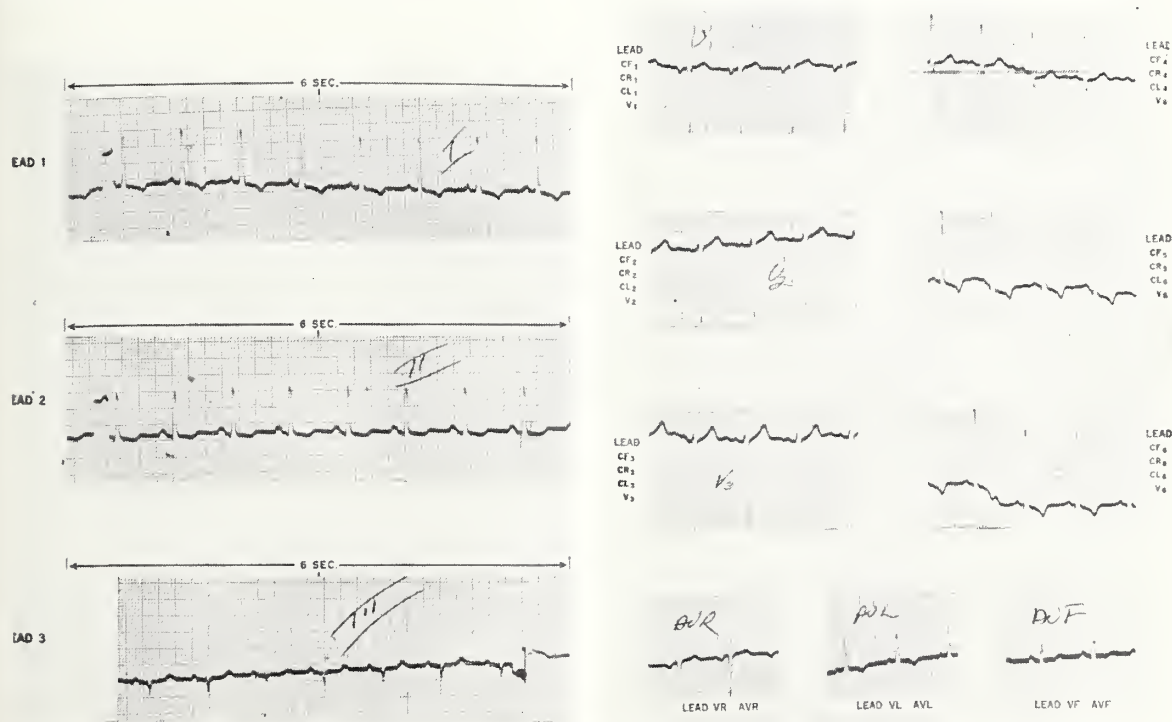


Figure 1. Electrocardiogram. Standard leads (a) and unipolar leads (b).

like to add a little information about the terminal episode. Apparently she was having her usual complaints at home, but she was suddenly seized with more severe pain than she had had previously. She sent her husband out for some medicine to relieve the pain, but on his return to the home he found her dead.

Dr. Delp: Was she dead in bed or on the floor?

Dr. Mantz: I do not know.

Dr. Delp: May we see the the electrocardiograms, Mr. Godwin?

Mr. Godwin: The electrocardiogram (Figure 1a and 1b) was taken in the doctor's office. The rate is about 95 with a regular rhythm of sinus origin. The QRS vector is about 20 degrees; the T vector is about 150 degrees. The QRS vector points posteriorly, and the T vector points anteriorly so that the QRS-T angle is somewhat greater than 130 degrees. There is inversion of the T waves in lead I, with isoelectric T waves in lead II. In leads V1, V2, and V3 there are rather deep S waves, and there are tall R waves in leads V4, V5, and V6. In leads V5 and V6 there is inversion of the T waves, but no deviation of the S-T segment. This electrocardiogram is compatible with left ventricular strain with hypertrophy.

Dr. Delp: Dr. Tice, the patient reportedly had been treated with 75 courses of radium. What does this mean?

Dr. Galen Tice (radiologist): I do not know what that means.

Dr. Delp: Could it have meant hours of treatment?

Dr. Tice: It might have. Was the radium locally administered?

Dr. Delp: I assume that it was.

Dr. Tice: Usually an hour of roentgen therapy doesn't mean very much.

Dr. Delp: Will you please present your differential diagnosis, Mr. Liggett?

DIFFERENTIAL DIAGNOSIS

Mr. Liggett: The patient was a 40-year old woman who had been hypertensive for at least five years. At the time that she was first examined she had a big left ventricle, an enlarged liver, and swollen feet. I think we can say that she had hypertensive cardiovascular disease. In accounting for the hypertension, which we will have to assume adds something of importance to this case, we must place some reliance on the studies that were done in the past. A young person who develops hypertension should have a work-up for pheochromocytoma and renal disease. The work-up was reported to be negative, so she probably had essential hypertension. There would be fairly good evidence for this. Essential hypertension would not be uncommon if she were from a hypertensive family. There was an elevation of the diastolic pressure in this patient; we do not know, of course,

whether she was carrying this for five years, but it is possible. In the course of her hypertension she developed chest pain which radiated widely.

In considering pain of the substernal type one must think of tumor, and this would be a good time to bring up the matter of the uterus. It is pure speculation, but 75 radium treatments leave me without anything to say except that possibly she was treated for carcinoma of the uterus, which can metastasize late. Surely we would have some other evidence of metastasis, and I cannot see any reason why it would cause hypertension. If it did go to the mediastinum and was causing pressure symptoms, one would surely see some evidence of it on fluoroscopy.

In a discussion of substernal pain one must consider pericarditis, but the patient had a normal temperature in the hospital. There is certainly no evidence in the electrocardiogram of any current of injury that would make one think of pericarditis.

The diagnosis of angina pectoris is made on clinical evidence, and it is relieved by nitroglycerin and rest. This patient's pain was not of that type. If the patient had had chronic coronary insufficiency she might possibly have had pain for a long time. I could not, however, find any reference to an individual who had had coronary artery insufficiency for this long a time without developing an infarction.

People with high blood pressure and mild failure often have various arrhythmias. This might have accounted for her dizziness, but it seems unlikely; it would not account for the pain.

If the patient had had an infarction that could account for this much pain, she would certainly have had some fever and would probably have had to stay in bed. This patient was up and around.

There is another structure in the chest which I have consciously avoided up to this point, and that is the aorta. It has the same innervation in the upper parts as the heart does, and one may get pain from that structure that closely resembles cardiac pain. If the patient did have disease of the aorta, and I think she did, one would have to consider syphilis. This occurs in the ascending aorta, and one would expect some murmurs and a positive serology. No murmurs were recorded, and no such aneurysm was seen on fluoroscopy.

An arteriosclerotic aneurysm is unlikely because it usually occurs in older persons, although arteriosclerosis is much accelerated in hypertensives.

There is one other thing which occurs in young people who have had a high diastolic pressure for years, namely cystic medial necrosis of the aorta which may lead to a dissecting aneurysm.

Both of the blood pressure values recorded are high, and this is significant. If blood had been escaping, the blood pressures would have fallen, and she would have had extreme vasomotor phenomena. She

had been having pain all the time. It was not a catastrophic thing at first, and one can visualize a dissection proceeding slowly and continuously. As the dissection continued farther it would account for the pain she had in her abdomen.

This patient's stay in the hospital was short, and pain is a nebulous thing. Interpreting pain in a person who is rational is difficult enough, but this patient was getting a lot of medication and she was terribly excited, so we don't know what was going on. I think that she was having severe pain and that her mental symptoms were a reaction to it and to the drugs she was receiving. The pain could also have accounted for her fainting.

After she went home we do not know what medication she took, but she continued to have pain which I can account for only on the basis of a continuing process which did not infarct the myocardium. I think that she ruptured her aorta. I do not know, but I suspect that it was within the abdomen.

Dr. Delp: Mr. Justus, how do you explain this patient's mental symptoms?

William J. Justus (fourth year medical student): I think it was likely a psychosis from barbiturate intoxication.

Dr. Delp: You do not think the patient's pain or discomfort had anything to do with it?

Mr. Justus: It may have aggravated it, but I think the barbiturate was the underlying feature.

Dr. Delp: Miss Kitchen, you saw the electrocardiogram. Do you think it is compatible with Mr. Liggett's diagnosis?

Miss Kitchen: Yes sir, because hypertension is a predisposing factor in dissecting aneurysm, and this electrocardiogram is just the sort of tracing one would see in a hypertensive person.

Dr. Delp: What do you think was the final episode in this patient, Mr. Godwin?

Mr. Godwin: I think it was a rupture of an aneurysm. Statistically the chances would be for a hemothorax or hemothorax, but it could have been in the abdomen.

Dr. Delp: Mr. Ketterman, the patient's blood pressure was reported at the time she was in the hospital as being 240 systolic and 140 or 150 diastolic. Is this compatible with the diagnosis?

Herbert Ketterman (fourth year medical student): Yes, it is. One thing about dissecting aneurysms is that the blood pressure will stay elevated unless they rupture.

Dr. Delp: Have you ever seen a patient with a dissecting aneurysm, Mr. Justus?

Mr. Justus: No, sir.

Dr. Delp: Do you think the patient presented the clinical picture of dissecting aneurysm?

Mr. Justus: Yes, sir.

Dr. Delp: Mrs. Howbert, what about the duration

of this patient's illness? Was it compatible with the diagnosis?

Mrs. Howbert: Many of the patients reported died within a few seconds or minutes after the first symptoms of dissection, but about 50 per cent lived for days or weeks.

Dr. Delp: Miss Kitchen, have you completely discarded the possibility that this patient had a myocardial infarction which was not visible on the electrocardiogram?

Miss Kitchen: Yes, sir.

Dr. Delp: I think that you were no more specific than to say that you thought this was post-aneurysmal rupture. Where do you suppose it ruptured?

Mr. Liggett: I think I did say that I thought it ruptured into the abdomen. My reason for this was that the necrosis usually does not occur around the ascending aorta. It is possible for these aneurysms to dissect back up to give a cardiac tamponade. I would suspect, from the continuing symptoms, that it dissected down the aorta and ruptured into the abdomen.

Dr. Delp: Dr. Rankin, do you have any comments concerning this case?

Dr. Thomas J. Rankin (internist): Not any very pretty ones. I would have to choose essential hypertension over pheochromocytoma or renal disease for the reasons discussed just a minute ago. My choice is also dissecting aneurysm, but I think the patient died of retrograde dissection and cardiac tamponade. Her mental condition has been mentioned. A dissecting aneurysm involving the arch of the aorta and decreasing the circulation to the cerebrum would have to be considered as an explanation for part of her behavior.

Dr. Delp: Dr. Peete, do you accept this diagnosis of dissecting aneurysm?

Dr. Don C. Peete (internist): Yes, it seems to me from what I have seen of dissecting aneurysms that this case fits the diagnosis.

Dr. Delp: I was looking in Dr. Osler's old system of medicine, and I found that he reported having seen a soldier who was dismissed from the British army because of an aneurysm. He lived in Montreal or thereabouts for 30 years subsequent to his discharge from the army. After he died, Dr. Osler was given permission to dissect and retain the aorta. It had recanalized itself with two channels from the ascending arch down to the bifurcation of the iliacs. The two channels ran continuously and were entirely epithelialized.

Dr. Wahl, will you please present the pathologist's report?

PATHOLOGY REPORT

Dr. Harry R. Wahl (pathologist): We were not able to find anything on which to base a diagnosis of carcinoma of the cervix. In certain areas of the uterus

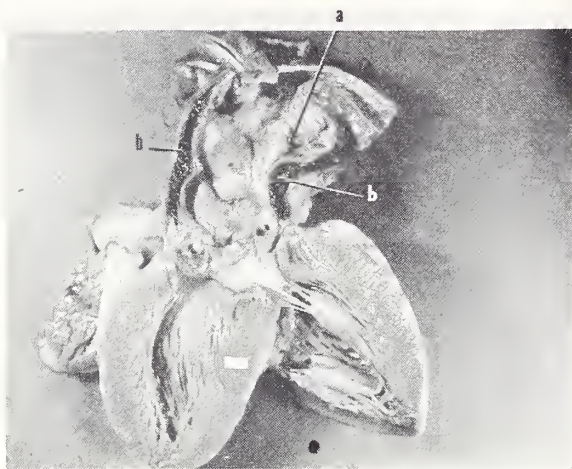


Figure 2. Section of heart and arch of aorta dissected to show the break (a) in the intima that allowed the blood to infiltrate into the degenerated media, producing the aneurysm (b).

there was scar tissue, but we could not even make the diagnosis of an irradiation reaction. The patient died of a cardiovascular disease. There were some changes in the kidneys, but they were those associated with essential hypertension.

Upon opening the chest we found that the pericardial cavity was greatly distended and contained 600 cc. of clotted blood. We found the lesion some of you anticipated, a dissecting aneurysm (Figure 2), and could demonstrate the place where the intima ruptured into the softened area of the media leading to the separation of the layers of the degenerated media by the infiltrating blood, resulting in a dissecting aneurysm.

There was a small lesion on the posterior part of the heart with extension of the aneurysm into the

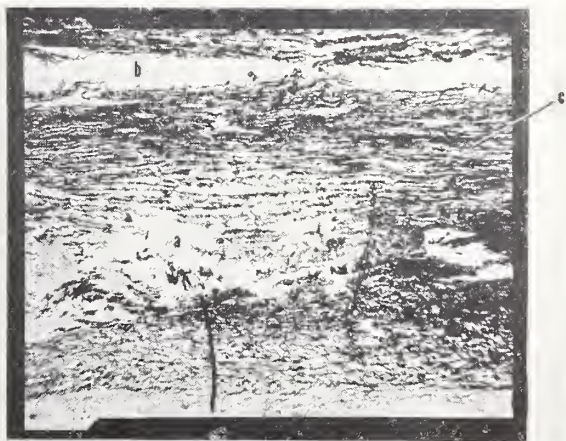


Figure 3. Photomicrograph of aorta rupture (a) and break (b) in the black staining elastic tissue (c) of the media.

pericardial cavity. Sections through the aneurysm showed organization which would indicate that it had been there for days and possibly even weeks before the final rupture occurred into the pericardial sac and precipitated almost immediate death. It is interesting to note the extensive atherosclerosis, scarring, and ulceration of the aorta, in spite of the fact that the patient was only 40 years old. There was another aneurysm just below the renal artery.

A connective tissue stain of a coronary artery showed extensive atherosclerotic changes in the smaller blood vessels. The small arteries throughout the viscera and splanchnic areas showed similar involvement.

An elastic tissue stain of a section of the aorta demonstrates a lack of elastic tissue fibers in the media (Figure 3). There are two conditions that produce dissecting aneurysms; both of them are caused by changes within the media. In one the changes are



Figure 4. Photomicrograph of the elastic tissue of the media separated into two distinct layers (b) between which the blood infiltrates (a) forming the dissecting aneurysm.

chiefly within the musculature of the media, and this usually occurs in individuals who are more than 40 years old. In the other type the changes are chiefly in the elastic tissue, and the condition usually occurs in individuals under 40 years of age. Sections from this patient show distinct changes in the elastic tissue of the aorta with disintegration of elastic fibers (Figures 3 and 4).

Dr. Klionsky: I would like to ask if anyone has ever seen a dissecting aneurysm in a pre-menopausal woman?

Dr. Delp: No.

Dr. Klionsky: It is a rare occurrence. Therefore, I think it is an important item.

Dr. Kurt Reissmann (internist): This case is a

very good example of the competence of Smithwick's criteria. Smithwick, as you all know, stated that whenever the pulse pressure is greater than one-half of the diastolic blood pressure plus 20, we should strongly suspect an atherosclerosis of the aorta. Now in this patient the pulse pressure was 150 while the diastolic pressure was only 130, so there was a high pulse pressure relative to the diastolic blood pressure and that was, from the beginning, strongly in favor of a severely diseased aorta.

Dr. Wahl: There is one point that was brought out that I think we should clarify: the confusion as to the difference between atheroma of the aorta and medial necrosis. What this patient had was medial necrosis, not atheroma. In ordinary arteriosclerosis there is an atheromatous change which is within the intima. Our patient did not have much intimal change but did have extensive medial necrosis which is quite different. It weakens the aortic wall and leads to the separation of layers of the media and a dissecting aneurysm.

Dr. Delp: Chest pain, continuous over hours, descending and migratory in character occurring in a patient with hypertension might reasonably suggest coronary disease. Since the symptoms were not associated with tangible changes such as shock and specific electrocardiographic signs, the possibility of dissection of the aorta became a distinct probability. The sudden death was compatible with cardiac tamponade.

PATHOLOGICAL ANATOMICAL DIAGNOSIS

Primary

Medial cystic necrosis of the aorta.

Recent dissecting aneurysm of the ascending aorta with rupture into the pericardium.

Small saccular aneurysm of abdominal aorta.

Hemopericardium, approximately 650 cc. of clotted blood.

Hypertrophy and dilatation of the heart, weight 480 grams (history of hypertension with blood pressure 280/130 for many years).

Focal and diffuse fibrosis of the myocardium, slight.

Subendocardial hemorrhages of right auricle.

Arterio- and arteriolar nephrosclerosis, slight, and arteriolar sclerosis of pancreas.

Arteriosclerosis of the thoracic and abdominal aorta, coronary, pulmonary, mesenteric, iliac, and splenic arteries, advanced.

Acute congestion of the lungs and liver, slight; of the spleen, advanced.

Accessory

Nodular thickening of the cusps of the mitral valve, moderate.

Calcified peripheral nodule of the lower lobe of the right lung.

Pyelonephritis of the right kidney, moderate.

Adenomatous hyperplasia of the left adrenal gland.

Right double ureter.

Infantile uterus.

Healed midline lower abdominal scar.

Surgical absence of the tubes and ovaries.

Atrophy and stenosis of the cervix uteri (history of irradiation treatment for carcinoma of the cervix 11 years prior to death).

Chronic gastritis, moderate.

Adenomatous nodular colloid goiter of the right lobe of the thyroid gland.

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Evaluation of Foreign Students

Approval of a program for evaluating foreign medical school graduates was given recently by the Board of Trustees of the American Medical Association. The board also accepted plans for administering a program proposed by a Cooperating Committee on Graduates of Foreign Medical Schools.

The committee is composed of representatives of the A.M.A. Council on Medical Education and Hospitals, the Federation of State Medical Boards of the U. S., the American Hospital Association, and the Association of American Medical Colleges.

Each foreign medical graduate who wishes to come to the United States as an intern or resident or in any other position that involves medical care of the American public must satisfy two requirements: (1) His credentials must clearly indicate that he was graduated from a bona-fide medical school; and (2) He must demonstrate, by examination, that he has medical knowledge equivalent to that demanded of graduates of schools in this country.

This evaluation service will be established within an independent organization whose affairs will be directed by a board designated by all of the four organizations. It is expected that the service will become effective within the next year.

Pediatric Patterns is the name of a new periodical published by Parke, Davis and Company to show the incidence of communicable diseases in any given area. It includes reports on poliomyelitis, diphtheria, streptococcal infections, measles, and whooping cough.

ACHROMYCIN

Tetracycline Lederle

in the treatment of infections in surgery

The prevention and control of cellulitis, abscess formation, and generalized sepsis has become commonplace technique in surgery since ACHROMYCIN has been available. Leading investigators have documented such findings in the literature.

For example, Albertson and Trout¹ have reported successful results with tetracycline (ACHROMYCIN) in diverticulitis, gangrene of the gall bladder, tubo-ovarian abscess, and retropharyngeal abscess. Prigot and his associates² used tetracycline in successfully treating patients with subcutaneous abscesses, cellulitis, carbuncles, infected lacerations, and other conditions.

As a prophylactic and as a therapeutic, ACHROMYCIN has shown its great worth to surgeons, as well as to internists, obstetricians, and physicians in every branch of medicine. This modern antibiotic offers rapid diffusion and penetration, quick development of effective blood levels, prompt control over a wide range of organisms, minimal side effects. There are 21 dosage forms to suit every need, every patient, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Broad-range antibiotic action to fight infection; important vitamins to help speed normal recovery. In *dry-filled, sealed* capsules for rapid and complete absorption, elimination of aftertaste.



¹Albertson, H.A. and Trout, H. H., Jr.: *Antibiotics Annual* 1954-55, Medical Encyclopedia, Inc., New York, N.Y., 1955, pp. 599-602.

²Prigot, A.; Whitaker, J. C.; Shidlovsky, B. A., and Marmell, M.: *ibid.*, pp. 603-607.



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ACHROMYCIN ACHROMYCIN

PHYSICIANS' ACTIVITIES

Dr. Farris D. Evans, Wichita, national surgeon general for the Veterans of Foreign Wars, was re-elected department surgeon of the state organization at a meeting held on June 3. He is also holding the office of surgeon for the Wichita post.

Sumner County and the city of Wellington have established a full-time health department with **Dr. Harry L. Cobean**, Wellington, as director.

The Parsons Clinic announces that **Dr. J. Gary Campbell**, formerly of Santa Barbara, California, joined its staff as ophthalmologist on July 1. Dr. Campbell is a graduate of Northwestern University.

Dr. John A. Grove, Newton, attended a meeting of the President's Committee for Traffic Safety in Chicago last month. He is chairman of the Committee on Trauma of the Kansas Chapter, American College of Surgeons.

Dr. Robert Shaw, Claflin, gave a talk on polio at a recent meeting of the Claflin Parent-Teacher Association.

Dr. Paul H. Lorhan, of the University of Kansas Medical Center, served as an examiner for the American College of Anesthesiologists in Chicago last month.

Scientific exhibits for the September meeting of the Kansas City Southwest Clinical Society are being prepared by several departments and individuals at the University of Kansas Medical Center. One on "Digitalis" and another on "Phonocardiography"

DEATH NOTICES

STANLEY GLEN LAING, M.D.

Dr. S. G. Laing, 55, Kansas City physician who specialized in obstetrics, died on May 26 while on a fishing trip in Lakeview, Arkansas. He had practiced in Kansas City since 1942, having graduated from the University of Minnesota School of Medicine in 1940 and taken a two-year internship at St. Margaret's Hospital, Kansas City. Among the survivors is a brother, Dr. Maurice V. Laing, also of Kansas City.

DALE E. CLARK, M.D.

Dr. Dale E. Clark, 36, who had been practicing in Cedar Vale since 1952, died of nephritis on June 4. Dr. Clark's college work was interrupted for four years while he served in the Army during World War II. He later completed his work at the University of Kansas School of Medicine, from which he was graduated in 1951. In his practice in Cedar Vale he was associated with Dr. L. Claire Hays.

CLAY EPHRAIM COBURN, M.D.

An honorary member of the Wyandotte County Medical Society, Dr. C. E. Coburn, 83, died at his home in Kansas City on June 8. He had been in practice for 57 years, and, although he closed his office last fall, continued to see patients in his home. For 23 years he was a member of the Kansas State Board of Health, and he served two terms as its president. He was also on the board of the Kansas Tubercu-

losis Association for 25 years and was head of that organization for 14 years. All of his practice was in Kansas City, except for service in the Army Medical Corps during World War I.

HARRY ROSWELL WAHL, M.D.

Dr. H. R. Wahl, 69, a prominent figure in the Kansas medical scene for many years, died on June 18. He had been associated with the University of Kansas School of Medicine since 1919, seven years after his graduation from Johns Hopkins University School of Medicine. Although his primary interest was in pathology, he had served in an administrative capacity for long periods of time, as acting dean from 1924 to 1927 and as dean from 1927 to 1948. From the latter date until 1951 he was head of the Department of Pathology. Since that time he had been engaged in pathological research.

Dr. Wahl was scheduled to retire this month when he reached his 70th birthday. In recognition of his services, the Kansas Board of Regents voted recently to change the name of the Medical Science Building at the Medical Center to Wahl Hall.

He was a diplomate of the American Board of Pathology and held membership also in the American Association of Pathologists and Bacteriologists and the College of American Pathologists. His recent research activities were in the fields of tumors of the sympathetic nervous system, disorders in fat metabolism, gastric lesions in Hodgkin's disease, and leukemia.

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Searle's New and Practical Steroid
Specifically for Protein Anabolism—

It has long been recognized that a substance which would promote protein anabolism would be of inestimable value in therapy. The androgens have this property, but unfortunately they also exert actions on secondary sex characteristics. These effects are commonly undesirable in therapeutic programs.

THE FIRST STEROID WITH ANABOLIC SPECIFICITY—Nilevar, the newest Searle Research development, therefore, meets a long desired clinical need because Nilevar presents the first steroid primarily anabolic for protein synthesis. Moreover, Nilevar is without prominent androgenic effects (only about one-sixteenth of that exerted by the androgens).

OBJECTIVE AND SUBJECTIVE RESPONSE —Orally effective, Nilevar therapy is characterized by retention of nitrogen, potassium, phosphorus and other electrolytes in ratios indicative of protein anabolism. Moreover, subjectively the patient observes an increase in appetite and sense of well-being.

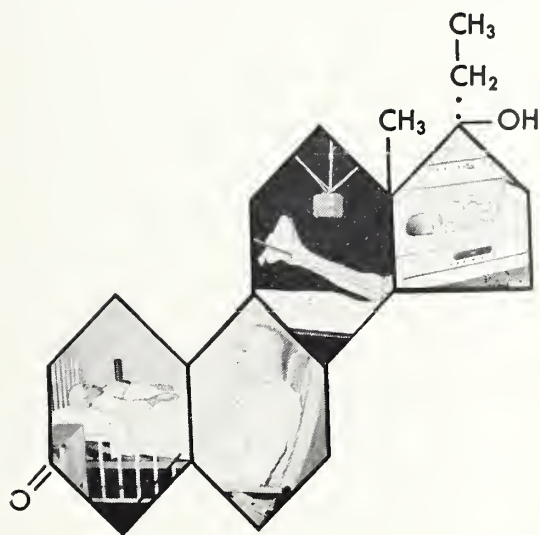
WELL TOLERATED—Nilevar has an extremely low toxicity. Laboratory animals fail to show toxic effects after six months of continuous administration of high dosages. Nilevar should not be administered to patients with prostatic carcinoma. Nausea or edema may be encountered infrequently. Slight androgenicity may be evidenced on high dosage or in particularly responsive individuals.

MAJOR INDICATIONS—Preparation for and recovery from surgery; supportive treatment of serious illnesses (pneumonia, poliomyelitis, carcinomatosis, tuberculosis); recovery from severe trauma and burns; decubitus ulcers; care of premature infants.

DOSAGE—The daily *adult* dose is three to five Nilevar tablets (30 to 50 mg.) but up to 100 mg. may be administered. For *children* the average daily dose is 1 to 1.5 mg. per kilogram of body weight; individual dosages depend on need and response to therapy.

SUPPLY—Nilevar is available in uncoated, unscored tablets of 10 mg. G. D. Searle & Co., Research in the Service of Medicine.

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SEARLE

will be shown by **Doctors E. Grey Dimond, James E. Crockett, T. K. Lin, and Sherman Steinzeig.** "Prosthetic Devices to Facilitate Hand and Foot Function" will be exhibited by **Dr. Donald L. Rose** and **Dr. Edward B. Shires,** "Cerebral Angiography" by **Dr. William P. Williamson** and **Dr. Karl Youngstrom,** and "Oculo-Systemic Syndromes" by the Department of Ophthalmology.

Dr. Franklin D. Murphy, chancellor of the University of Kansas, Lawrence, will serve on a special committee appointed by the Ford Foundation to plan distribution of an appropriation of \$90,000,000 to the nation's medical schools.

Dr. Orville R. Clark, Topeka, has been named as a Topeka Board of Education appointee on the Washburn University Board of Regents.

A report on a tour of Soviet Russia was made to the Wichita Rotary Club last month by **Dr. Rene M. Gouldner,** Wichita, who spent the month of May on his trip behind the Iron Curtain.

Dr. Emery C. Bryan, Erie, was elected recently as vice president of the newly formed Neosho County Mental Health Association.

Dr. Charles A. Hunter, Jr., of the University of Kansas Medical Center, recently became a diplomate of the American Board of Obstetrics and Gynecology.

In recognition of his 50 years of practice, **Dr. C. C. Nesselrode,** Kansas City, was guest of honor at a party given by relatives and friends on June 3. A reunion of members of the 1906 medical school class of the University of Kansas was held on the same date at Lawrence. Other class members are **Dr. John A. Crabb,** Topeka; **Dr. Mildred Curtis,** Iola, and **Dr. Fred D. Lose,** Madison.

Dr. Philip A. Bearg, Topeka, resigned last month as state epidemiologist to accept a position as professor of public health at Jefferson Medical School and director of the Fife-Hamill Memorial Health Center, Philadelphia.

A surgical practice in Independence will be begun soon by **Dr. M. K. Borklund,** a graduate of Indiana University School of Medicine who recently completed a residency at General Hospital, Kansas City, Missouri.

Dr. Leonard Diehl, who has been practicing in Osborne for three years, closed his office there last month to move to Oklahoma City to enter a general practice partnership with two other physicians.

Dr. Roy A. Lawson, Jr., former instructor in medicine at the University of Kansas Medical Center, has been named superintendent of the new Southeast Kansas Tuberculosis Hospital in Chanute.

Plans to enter practice in Cedar Vale have been announced by **Dr. Ivan E. Lloyd,** a 1955 graduate of the University of Kansas School of Medicine who recently completed internship at Wesley Hospital, Wichita.

A feature story about **Dr. Fred D. Lose,** who has completed 50 years of practice in Madison, was published in recent issues of the *Madison News* and of the *Emporia Gazette.* He was honored at a community celebration on June 10.

Dr. Charles LeRoy Williams was named president of the Sedgwick County Heart Association at a meeting held in Wichita last month. **Dr. Katherine Pennington** was elected vice-president in charge of programs. A panel discussion on "New Advances in Treatment of Heart Diseases" was presented at the meeting by **Dr. Pennington, Dr. Ben H. Buck, Dr. W. Carter Goodpasture,** and **Dr. C. Gayle Stephens.**

Dr. G. George Ens, who recently completed internship at St. Luke's Hospital, Kansas City, Missouri, began general practice in Hillsboro on July 1.

Dr. William F. Splichal, who has practiced in Belleville since 1931, moved to Manhattan last month and has opened an office there.

The city commission of Topeka recently reappointed **Dr. B. I. Krehbiel** to its health advisory board.

A feature story about **Dr. H. B. Hogeboom,** Topeka, was published in the June 10 issue of the *Topeka Daily Capital.* Dr. Hogeboom was celebrating the 60th anniversary of his graduation from medical school.

Dr. C. W. Erickson, Pittsburg, addressed the Lyon County Medical Society in Emporia on the subject of "The Tired Patient" on June 5.



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peach-colored, newest
liquid form of the
established broad-
spectrum antibiotic...

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specially homogenized
for rapid absorption;
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†Brand of oxytetracycline

Dr. Harry J. Davis, who has practiced in Topeka for 31 years, announced his retirement recently.

Dr. George Hopson, formerly of Stockton, is now practicing in DeSoto, Missouri.

Participate in Research Program

Thirty-nine physicians of the Wichita area are now participating in a research project of the National Disease and Therapeutic Index. A study is being made of the nature, scope, and frequency of occurrence of non-fatal disease, injury, and other conditions seen by the doctor in private practice in the United States.

Statistical data will be compiled to show why patients see doctors and what types of treatment they receive. Nearly 900 doctors in 27 areas of the country are cooperating in the study. The Wichita group is composed of 21 general practitioners, five internists, four surgeons, three obstetrician-gynecologists, two urologists, two otolaryngologists, one pediatrician, and one dermatologist.

Evaluation of reports for the first three-month period indicates that the results of the study will be of value. Each participant will report four times a year on the age, sex, diagnosis or diagnoses, and therapeutics administered to or prescribed for each patient seen during the course of a 48-hour period. The names of the patients are not reported, and the reporting physicians are not identified with case records.

The data will be processed and evaluated in 1957.

Denver Chiropractor Dies

A paragraph in a recent issue of *Time* reported the death of "Dr. Leo L. Spears, 62, high-flying quack, head (since 1943) of Denver's glassy Spears Chiropractic Sanitarium."

Long a controversial figure, Spears was charged with manslaughter on the death of a young patient six weeks after he opened his clinic. He was acquitted, sued state health officials for \$300,000, and lost the case. He later sought damages for libel suits totaling some \$36 million but did not collect. The Colorado State Medical Society was one of the defendants in a 1955 suit.

Although the hospital property was appraised in 1954 at \$8,360,000, Spears felt that his progress was hampered by the "medical monopoly." His chief targets were the Veterans Administration, which does not authorize payment for chiropractic treatment for veterans, and the American Medical Association.

The Spears institution, which on occasion bought

as much as a full page of newspaper space in a Kansas daily to advertise its "success" in treating polio and muscular dystrophy, also mailed booklets in bulk to Kansans, picturing and describing patients it had "cured" of cancer, cerebral palsy, and other dread diseases.

ANNOUNCEMENTS

American College of Gastroenterology, annual course in postgraduate gastroenterology, The Roosevelt, New York City, October 18-20. Information available from the College, Department P.G., 33 West 60th Street, New York 23, New York.

Eighty-fourth annual meeting, American Public Health Association, and meetings of 40 related organizations, Convention Hall, Atlantic City, November 12-16. Write A.P.H.A., 1790 Broadway, New York City.

Seventh Congress, Pan-Pacific Surgical Association, Honolulu, Hawaii, November 14-22. Physicians invited. Address Dr. F. J. Pinkerton, Room 230, Young Building, Honolulu.

The American Academy of Obstetrics and Gynecology has been renamed the American College of Obstetricians and Gynecologists. Headquarters are located at 116 South Michigan, Chicago 3, Illinois.

The American Board of Obstetrics and Gynecology announces that applications for certification for 1957 examinations are now being accepted. Deadline is October 1. Address Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6, Ohio. The Part I examination this year was taken by 430 candidates, with 382 successfully completing the work. Three hundred seventeen of 415 candidates for Part II examinations were certified.

Examinations for qualified fellows of the International College of Surgeons will be held in Chicago, July 23 and 24 and October 29 and 30. Oral conferences on August 6 and October 22. Details available from Secretary of the College, 1516 Lake Shore Drive, Chicago 10, Illinois.

Total holdings of Series E and Series H Savings Bonds, according to Treasury Department records in April, amounted to \$40,630,000,000.

DOCTORS EVERYWHERE NOW KNOW WHY Viceroy's Are Smoother

THE VICEROY TIP HAS ...

**TWICE
AS MANY
FILTERS**



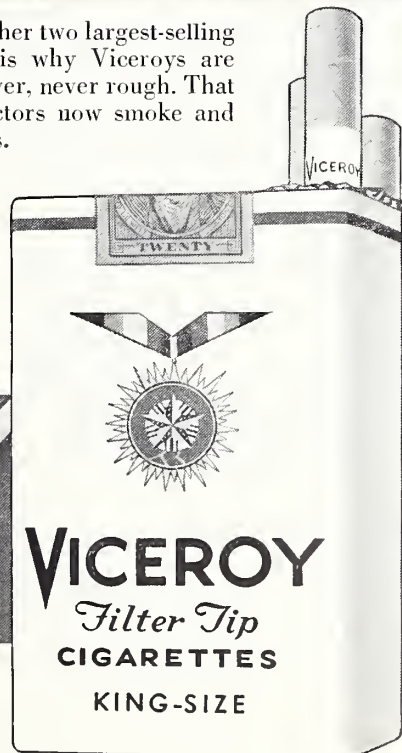
Professional men who have studied the microscopic analysis of the Viceroy filter now know why the Viceroy taste is smoother—never rough. Only Viceroy has 20,000 tiny filters in every tip—twice as

many filters as the other two largest-selling filter brands. That is why Viceroy's are smoother by far—never, never rough. That is why so many doctors now smoke and recommend Viceroy's.

Yes, smoother taste because there are
TWICE AS MANY FILTERS
IN EVERY VICEROY TIP
as the other two largest-selling filter brands!



Viceroy's exclusive filter is made from pure cellulose—soft, snow-white, natural!



THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

Before the end of the year hundreds of thousands of dependents of military personnel, living in all parts of the country, should be receiving their medical care from private physicians and in private hospitals under the new program authorized this year by Congress. While Defense Department has not yet completed regulations to implement the act, the law itself lays down the basic principles governing the program.

The House Armed Services Committee first attempted to decide on a system or systems for furnishing private care, through Blue Cross, Blue Shield, arrangements with state medical societies, commercial insurance or "home town care," such as Veterans Administration successfully employs. But the committee gave up on the problem, and Congress finally tossed it to the Secretary of Defense by stating in the bill that he shall "... after consultation with the Secretary of Health, Education, and Welfare . . . contract for medical care for such persons . . . under such insurance, medical service or health plan or plans as he deems appropriate." A Defense Department task force now is attempting to decide how to work out the contracts.

Although several groups of dependents will be entitled to medical care, only wives (or husbands) and children of men on active duty will be certified for civilian care. The others will be admitted to military medical facilities on "availability of space" basis. While generally spouses and children of active duty personnel will have a choice of private or military care, there is this limitation: The Secretary of Defense may designate certain areas where private care will not be authorized, if in his opinion those areas have military facilities adequate to care for the service families.

Dependents will be required to pay the following charges: For care in military facilities, subsistence and "in-hospital" charges (set by Secretary of Defense and currently \$1.75 per day); for private care, the same fees or the first \$25, whichever is the larger.

The time limit on private care is 12 months, but if hospitalization still is required after this period the dependent will be protected. In this case the Defense Department will transfer the dependent to a military facility or will make direct payment to a private hospital.

Although regulations will spell out limitations and authorizations in more detail, the law makes the following provisions:

Care in military facilities to include: 1. Diagnosis, treatment of acute medical and surgical conditions, treatment of "contagious diseases," immunization, and maternity and infant care. 2. Hospitalization for nervous and mental disorders, chronic diseases, or elective medical and surgical treatments *but only in "special and unusual cases"* and for not more than 12 months. This would be provided at the discretion of the Secretary of Defense. Dental care is not authorized except in unusual cases, while abroad, or at remote stations in the United States.

Private care will include: 1. Hospitalization in semi-private accommodations up to one year for each admission, including all necessary services and supplies furnished by hospital. 2. Medical and surgical care incident to hospitalization. 3. Complete obstetrical and maternity service, including prenatal and postnatal care. 4. Physician or surgeon's services prior to and following hospitalization for bodily injury or surgery.

Under the private care program, some services may be furnished outside the hospital, such as surgery in a doctor's office, x-rays, or laboratory tests, "but not what is normally conceived to be out-patient care." If experience shows they can be afforded, additional services may be authorized, but whatever the scope of private care, it cannot exceed that furnished in military facilities. Out-patient care will be furnished by military facilities, but "uniform minimal" charges may be imposed as a restraint on excessive demands.

Federal appropriations for medical research are at an all-time record, explained in part by Senate approval of a 48 per cent increase over last year's funds.

Dr. Lowell T. Coggeshall, special assistant to HEW Secretary Folsom, believes some "wise changes" should be made in medical economics to facilitate payment for the "spectacular" new medical services. He expressed his views in addressing a group at the University of Pennsylvania Medical School.

Russia and eight satellites, out of active participation in the World Health Organization for more than six years, now are back in; they agreed to pay 5 per cent of past-due assessments over a 10-year period.

The highway program contains a provision for a one-year study of traffic safety, a problem in which the American Medical Association has been actively interested for years.

The American Hospital Association reports that 275,000 professional nurses provided service in hospitals in 1954. This includes more than 245,000 hospital employees and nearly 30,000 private duty nurses.

For that morning break-



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Mental Disease

The Development and Present Status of Surgical Treatment

DEAN COLLINS, M.D., *Panama Canal Zone*

Medicine is constantly searching for newer and more effective methods of treating the ills of mankind. Each generation of physicians sees old practices continued, new developments made, old techniques improved, former methods revived, and present ones discarded. The history of every disorder is filled with these undulations that provide for the progress of the profession. Although in the immediate consciousness of the casual observer one man may be identified with a particular disease, its diagnosis and therapy is the result of almost innumerable contributions by his predecessors, contemporaries, and successors.

Since the dawn of mankind the healers of the race have treated mental disorders. There has been an endless progression of various modes of therapy; yet, spanning the entire period, surgical intervention has waxed and waned in its degree of acceptance. This article gives a review of its development and reception.

Surgery itself emerged as a branch of the healing arts in the early era of prehistoric man. There is good archeologic evidence that primitive man used surgical procedures in his attempts to relieve suffering or correct abnormalities. The procedure of trepanation of the skull is of particular significance in this discussion. Ancient examples of trephined skulls have been discovered in many parts of the world. It has been established that those unearthed in France in the middle of the 19th century date back to one of the stone ages of man. The practice apparently originated in Europe and North Africa during the time of the megalithic constructions—5,000 to 4,000 years ago.²⁸

Numerous investigators have conjectured as to the purpose of this operation. Wakefield and Dellinger described primitive man's concept of pathology: "He regarded all disease as belonging to one of three categories: (1) Disease was something projected into the body of the victim. (2) Disease was something that could be taken from the body of the victim. (3) Disease was the effect of something on some part of, or some object connected with, the body of the victim. It is reasonable, therefore, to state that whenever and

wherever the first human skull was trephined, probably one of these concepts, or more than one, was the compelling motive for the procedure. The operation was performed: (1) to permit the entry or projection of something into the body of the victim, (2) to permit escape of, or to take from the body, something, or (3) to combat sorcery. Objections could be raised to calling this a surgical procedure on the grounds that surgical procedures are performed for objective reasons and not to allow some imaginary material to escape. In answer to these objections it may be stated that demons, spirits or other supernatural beings were objective to the primitive. No one should ever suspect that primitive man was insincere in his reasons for trephining the skull."⁵⁴

Although there were undoubtedly various indications for trepanation, the question of whether it was performed for mental disorders, as such, remains debatable. Broca came to the conclusion, after extensive work on pre-Columbian trepanation in Peru, that it "was performed only upon young subjects; that, therefore, it was performed for epileptic crises, or even upon the insane. The object was to allow the escape of the demon—the spirit that had caused the headache."⁸ (Quotations from foreign literature were translated by the author.)

Lucas-Championnière was convinced that motivations were much simpler than the "religious fanaticism" suggested by Broca. "Authors who have given free rein to their imaginations have found highly romantic interpretations for their observations. They suppose that primitive man must have opened the skull to let out the demons causing convulsions or insanity."³⁴ Instead he believed that motivations were arrived at by empirical means—"a series of regular observations, greatly delayed by tradition. This therapy disappeared over the centuries, leaving only trepanation limited to fractures of the skull, a practice one may consider only a remnant of the more extensive and more perfect prehistoric practice."³⁴ Ballance, Sigerist, and Hrdlicka, among others, mention trepanation as a therapeutic measure for insanity.

Research during the past century among primitive or aboriginal groups in North Africa, the Balkans, Peru, and the South Pacific has contributed to the understanding of this question.

"The operation of trephining of the skull is still being attempted by present-day aborigines; and if a deduction is permitted from the present practice, the

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Collins is now serving his internship at Gorgas Hospital, Panama Canal Zone.

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purpose of trephination (as intimated previously) was to afford relief from convulsions, epilepsy, headache and mental disorders. This operation was not so much to affect the cranial contents or the skull but to afford an opening for the evil spirit to escape from the skull of the sufferer."²¹

Selling has given an interesting reconstruction of the prehistoric indications for the operation. "Confronting the witch doctor in the present instance was a patient who was definitely down-hearted, who couldn't concentrate on the business of acquiring enough food-stuff to sustain himself and his family, and whose family wanted something done about it. The witch doctor, so far as we know, was the earliest psychiatrist, for he had a technique for curing the mental affliction of this injured individual. . . . It is interesting to note that most of the skulls which have been observed in various places where trephining was carried out by primitive people belonged to women. Either in the early days of the race women were more subject to headache, convulsions or insane behavior than men, or they were easier to operate upon. It would seem, nevertheless, reasonable to assume that the first operations were performed on men, because only from the experience of seeing the results of an injury to a man's skull could the priest come to the conclusion that the seat of the intellect, or the seat of the motor control of the body lay in the brain."⁴⁸

Trepanation of the skull continued through the recorded history of the Greek, Roman, and Arabic eras of medicine, but only in the treatment of fractures. The first recorded recommendation of surgery for mental disorders comes from the Golden Period of the Salernitan school of medicine. Roger Frugardi (Roger of Salerno) in his *Cyrurgie* states that "for mania and melancholy, the skin is incised in the shape of a cross on the top of the head, and the skull is perforated in order that matter may emanate (i.e., as a vapor) to the exterior. The patient, however, is held in chains and the wound is dressed as we have explained above."⁵³

Willelmi de Congenis (Guillaume de Burgensis) patterned his *Cyrurgia* in large part after Roger of Salerno. He recommends that "for mania and melancholy the patient is held fast in chains and then on the top of the head an incision in the shape of a cross is made. The skull is perforated with a trephine so that matter may emanate, and if anything is there that may be cleansed through the opening, that is done. Afterwards the treatment of the skull and the wound proceed (as explained above)."⁵³ He also describes the management of "precipitous insanity."

"Whenever someone suddenly becomes deranged and speaks as if insane, a pullet divided in the mid-line or a puppy is tied on his head. If this is not effective, a cauterization is made on the anterior part

of the head. The hand is then placed upon the apex of the patient's nose and the cauterization is made at the tip of the longest finger."⁵³

Steinschneider discovered a description of a trepanation for melancholy in a fragment of an unedited work, "*ha Josher*"—a 13th century Hebrew manuscript—in which an otherwise unknown physician, called Heinrich von Erpendora, or Heinrich von Erfurt, physician to Bishop Hegmon of Cologne, states:

"And if all this does not help, then one must proceed in the following manner—one may perform this operation (Pe' ulla) only if the man looks so completely hopeless that death would be better than life. Actually I did this myself on someone who had been referred to me in extremis, after I had proceeded without result with every therapeutic measure all the books mention.

"I then took the skull of a corpse, weighed it and measured its thickness, and prepared a silver stick, to one end of which was skillfully attached a nail that would not puncture the deepest covering of the main (pia mater), for it is a fact that there are three layers of covering over the brain. I first removed the hair, skin and flesh with an instrument which I will mention in (the section on) the technique of the surgery. Then (I ordered) a piece of wood or iron applied, and around this carefully made fine perforations, after I had given him (the patient) a sufficient sedative (Schlaftrunk). Then I took a small piece of iron with a skillfully fashioned point that could penetrate through the hole only the thickness of the bone, and with it broke (the skull) from hole to hole until I could loosen the bone from the skin—I had previously poured a little rose oil in the holes. When I opened the head, immediately there arose a vapor as from a boiling pot, and simultaneously he was cured.

"I laid a thin cloth on his brain, and on that a salve which promotes tissue growth, and which I will mention in the section on surgery, until he was completely cured. I ordered him to be careful the rest of his life—any physician will understand why. I also ordered him to refrain from coitus for a year."⁵¹

In 1526, Paracelsus wrote a book on mental diseases, not published until 1567, in which he described both medical and surgical therapy of mania.

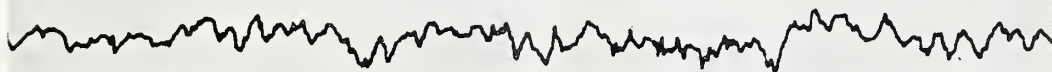
"As in the case of the 'falling sickness' (epilepsy), so must we consider and arrive at a cure for mania. The treatment for mania, however, is of two types: one surgical, the other physical. Yet it occasionally happens that both must be employed at the same time. First let us consider the surgical cure, then the physical. We present here the management which ought to effect a cure. Although the surgery is difficult to explain, we give this advice to everyone: that no one should undertake it unless he has been expertly trained by unique experiences in all sorts of

WHAT IS THE DIFFERENCE BETWEEN A TRANQUILIZER AND A SEDATIVE?

Comparison of the effect of Raudixin (tranquilizer) and a barbiturate (sedative) on the cortical electroencephalogram



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cases—this we suggest honestly in the book on external cures. In practice the surgery is performed thusly: first, make a hole at the site of origin of the mania. If there is any doubt about its location, open the ends of the digits of the feet and hands, and make a hole in the center of the head. This latter opening may be of two types: either lift and remove the skin so that the bare flesh shows, or else make other holes so that a scab falls out and the hole remains. Indeed this operation must be performed according to the type of sickness. If the disease is severe and recurrent, then the first skin opening does not affect the primary cause of the mania, but since one has gone this far, one must proceed to make another deeper wound. This latter opening allows emanation of a type of secretion (vim). Now follows the recipes for both openings."⁴⁴

Paracelsus then gives the prescriptions for three different ointments to be used in the trepanation perforations as healing medications.

The 1671 edition of Severinus' *De Efficaci Medicina* also advocated the trepanation of the skull for the cure of mania and melancholy. He quoted Antonius Guainerius (mid-15th century) that many patients had had portions of the skull burned out, the membranes exposed, and inspected.¹²

Surgery of the brain remained essentially in the same state over the next two centuries until, under the influence of experimentation in other fields, interest in experimental work on the brain began to develop. Man himself has been the subject of experiments of nature, and of his own devising, and a considerable body of knowledge has grown up concerning the effects of tumors and injuries of the brain. In 1691, Robert Boyle described the case of a British horseman who, after having been thrown from his mount, suffered a combined sensory and motor paralysis of one side of his body.

"On examination of his head a depressed fracture was disclosed just beneath the vertex on one side. When the large spicule of bone that had pressed upon the underlying dura mater was removed by the surgeon, the young nobleman recovered not only motor power, but also sensory perception in his afflicted arm and leg—and, so the record goes, he also recovered his 'spirits.' This remarkable case history stands as a landmark in the history of functional localization in the human brain—one of those extraordinarily prescient observations that might have led to the discovery of the motor area nearly two hundred years before it was in fact recognized."⁴

Knowledge of the function or influence of the frontal lobes themselves was enhanced by the reports by Harlow of the case of Phineas Gage. In 1848, Gage sustained an injury in which a tamping bar was driven through his skull, entering "anterior and ex-

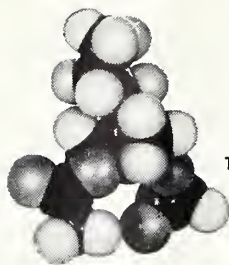
ternal to the angle of the inferior maxillary bone on the left" and emerging slightly to the right of the sagittal and anterior to the coronal sutures. The first report describes in some detail the lengthy recovery period, and the second presents a 20-year follow-up on the case, just after Gage's death. In the latter Harlow describes the patient on a visit seven months after injury.

"General appearance good; stands quite erect, with his head inclined slightly towards the right side; his gait in walking is steady; his movements rapid, and easily executed. . . . His physical health is good, and I am inclined to say that he has recovered. Has no pain in head, but says it has a queer feeling which he is not able to describe. Applied for his situation as foreman, but is undecided whether to work or travel. His contractors, who regarded him as the most efficient and capable foreman in their employ previous to his injury, considered the change in his mind so marked that they could not give him his place again. The equilibrium or balance, so to speak, between his intellectual faculties and animal propensities, seems to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was not previously his custom), manifesting but little deference for his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating, devising many plans of future operation, which are no sooner arranged than they are abandoned in turn for others appearing more feasible. A child in his intellectual capacity and manifestations, he has the animal passions of a strong man. Previous to his injury, though untrained in the schools, he possessed a well-balanced mind, and was looked upon by those who knew him as a shrewd, smart business man, very energetic and persistent in executing all his plans of operation. In this regard his mind was radically changed, so decidedly that his friends and acquaintances said he was 'no longer Gage.'"²⁶

It is interesting to note that Harlow was not stimulated to pursue the explanation for the behavioral changes observed.

"This case is chiefly interesting to me, as serving to show the wonderful resources of the system in enduring the shock and in overcoming the effects of so frightful a lesion, and as a beautiful display of the recuperative powers of nature. . . . I can only say, in conclusion, with good old Ambroise Paré, 'I dressed him, God healed him.'"²⁶

The late 19th century brought with it a greatly heightened interest in pathology and animal experimentation. This was the flowering age of physiology, and with the discovery of the motor area in 1869-1870, the concept of functional localization in the forebrain developed rapidly. There followed numer-



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ous experimental ablations of the frontal lobes of animals, but the emotional changes were poorly differentiated from the learning deficits. David Ferrier, in 1875, gave a brilliant description of the effects of orbitofrontal ablation in monkeys:

"The experiments show conclusively that an animal deprived of its frontal lobes retains all its powers of voluntary motion unimpaired, and that it continues to see, hear, smell, and taste, and to perceive and localize tactile impressions as before. It retains its instincts of self-preservation, retains its appetites, and continues to seek its food. It is also capable of exhibiting various emotions. The result, therefore, is almost negative, and the removal of a part of the brain which gives no external response to electric stimulation exercises no striking positive effect; and yet the facts seem to warrant the conclusion that a decided change is produced in the animal's character and disposition. For this operation I selected the most active, lively, and intelligent animals which I could obtain. To one seeing the animals after the removal of their frontal lobes little effect might be perceptible, and beyond some dullness and inactivity they might seem fairly up to the average of monkey intelligence. They seemed to me, after having studied their character carefully before and after the operation, to have undergone a great change. While conscious of sensory impressions, and retaining voluntary power, they, instead of being actively interested in their surroundings, ceased to exhibit any interest in aught beyond their own immediate sensations, paid no attention to, or looked vacantly and indifferently at, what formerly would have excited intense curiosity, sat stupidly quiet or went to sleep, varying this with restless and purposeless wanderings to and fro, and generally appeared to have lost the faculty of intelligent and attentive observation."¹¹

Bianchi made similar astute observations on behavioral changes in monkeys whose frontal lobes had been removed, but it was not until after the work of Pavlov that objective methods for analyzing the changes were developed, and such work met with general acceptance.

Goltz, disagreeing with the concept of functional localization, attempted to show through artificial lesions of the cerebral cortex in dogs that the extent of behavioral change which followed any given lesion depended upon the extent of the lesion, irrespective of the area removed. He noted that lesions in the posterior part of the cortex were followed by a general slowing of spontaneous activity, whereas those in the frontal lobes were followed by hyperactivity and signs of what we now term "sham rage."

These observations led Gottlieb Burckhardt, director of the Insane Asylum in Préfargier, Switzerland, to institute surgical removal of portions of the

left temporoparietal region in six violent schizophrenics. He reasoned that this procedure might have a calming effect on agitated patients who were responding with disturbed behavior to vivid hallucinations. "If we could remove these exciting impulses from the brain mechanism, the patient might be transformed from a disturbed to a quiet dement."¹⁶

Four operations were required in his first patient, who eventually recovered sufficiently to live at peace with her fellow patients. There were five other patients operated upon with one fatality and one social recovery, although this patient died by drowning a month after discharge. This work met with violent opposition in the medical profession, and he was forced to abandon the procedure. However, he published a detailed report of his work, concluding with the statement: "But I would not allow myself to become discouraged, and hope that my colleagues will nonetheless, while utilizing my experience, themselves tread the path of cortical extirpation with ever better and more satisfactory results."¹⁹

Burckhardt must be considered the first physician in modern times who undertook a surgical operation upon the anatomically intact brain in the hope of relieving mental symptoms. The next investigator to enter the field was the Russian surgeon Puusepp, who, in 1910, severed the connections between the frontal and parietal lobes unilaterally in three patients with manic-depressive psychoses. He met with so little success that he did not publish a report until the advent of prefrontal lobotomy.

Psychosurgery in the modern sense had its origins in the pioneering investigations of Egas Moniz in 1935. Moniz, a Portuguese neurologist, for some years previous to this time had been interested in the status of therapy of mental disorders. The communication with which he first made public his experimental work with lobotomy opens with the preface: "Therapy in psychiatry is anything but encouraging, with the exception of malaria therapy in paresis. Every attempt made to increase the possibilities of cure in the psychoses should, consequently, receive the benevolent attention of all those consecrated to the thankless and difficult task of treating the insane. The ideas on pathogenesis and the new methods of treatment which we have formulated could appear too daring; nevertheless, we hope that the results already obtained will justify our audacity."³⁷

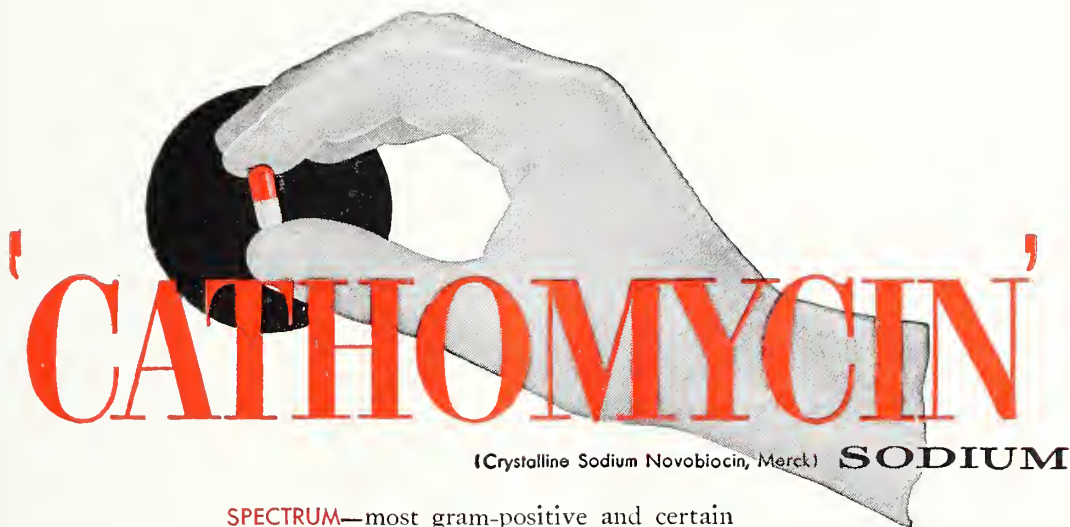
To justify performing the operation on human beings he relied largely upon the detailed reports by Brickner of the patient whose two frontal lobes had been removed by Dandy in 1930 for an extensive meningioma. In spite of marked behavioral changes observed in this patient, Brickner felt that his psychic function was altered more in quantity than in quality

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and that he remained essentially the same type of person after the operation.

With these ideas germinating in his mind, Moniz attended the Second International Neurological Congress in London in the summer of 1935. The stimulus for his future work came from a symposium on the frontal lobes. In the preface to his larger monograph on the work he cites the comments of both Henri Claude and Clovis Vincent on the functions of the frontal lobes and the effect of their ablation. He also directs attention to the report of Fulton and Jacobsen on the behavioral changes observed in chimpanzees following bilateral removal of the frontal areas. He later stated that results reported for the chimpanzee convinced him that the operation would be useful in man.

Fulton describes the events at that symposium: "Following this procedure there was no sign of reflex change in either animal and on superficial inspection their cage behavior did not seem to have altered particularly. On closer scrutiny, however, it was evident that a profound change had occurred, for prior to the second operation both animals showed frustrational behavior. . . . Following the second operation the animals seemed devoid of emotional expression . . . as Jacobsen said picturesquely: 'It was as if the animal had joined the happiness cult of the Elder Micheaux and had placed its burdens on the Lord.'"

"After the paper was read, in which behavioral changes in our two chimpanzees were described (in London in August of 1935), Dr. Moniz arose and asked if frontal-lobe removal prevents the development of experimental neuroses in animals and eliminates frustrational behavior, why would it not be feasible to relieve anxiety states in man by surgical means? At the time we were a little startled by the suggestion, for I thought that Dr. Moniz envisaged a bilateral lobectomy which, though possible, would be a formidable undertaking in a human being."¹⁹

Moniz reasoned that in psychotic individuals there was a certain stereotyped behavior, an unceasing round of complaints, mannerisms, verbigerations, delusions, and hallucinations that might well be associated with abnormal stabilization of synaptic patterns in the brain. "In accordance with the theory which we have just developed, one conclusion is derived: to cure these patients we must destroy the more or less fixed arrangements of cellular connections that exist in the brain, and particularly those which are related to the frontal lobes."³⁷

With this formulation he persuaded Almeida Lima, a neurosurgeon, to operate on certain patients who had proved refractory to other methods of treatment. Sobral Cid, professor of psychiatry of the Medical Faculty of Lisbon, assisted in selection of cases and provided clinical observations. At first alcohol injec-

tions were made into the subcortical white matter, but later an instrument (leucotome) was designed to cut spherical cores. The first report covered 20 patients, all agitated psychotics of different types. The results published were:

"1. No mortality. The procedure is harmless when the necessary precautions are taken.

"2. No patient was made worse by the operation.

"3. In all the cases, there resulted:

Cure (clinical) 35% (7)

Improvement 35% (7)

No Change 30% (6)

"The psychic symptoms most effectively relieved by the treatment were anxiety, delusions in depression and hypochondriasis, psychomotor excitation, manic reaction and secondary paranoid delusions."³⁷

It was not without a measure of trepidation that Moniz entered upon this work. In the preface to his monograph he states: "Scientific investigation in the clinical field is often very difficult, since it places in jeopardy the lives of the patients, which we, as physicians, hold in highest regard. Considerable reflection is necessary before performing procedures which could be injurious to the patient. Every circumstance must be taken into consideration; every hypothesis must be weighed and pondered."⁴⁰

He foresaw the controversy that was to arise following the introduction of such a radical procedure: "We are convinced that rather lively discussion over this work will arise in the disciplines involved—medical, psychiatric, psychologic, philosophic, social, etc. We are expecting it, in the hope that this discussion will aid in the progress of science and especially in the improvement of the state of mental patients."⁴⁰

During the next year Moniz published the results of his work and formulations of the neurophysiology involved. In France, Germany, and England, where psychoanalysis and shock therapy were popular, the procedure was practically ignored, but in Italy it was received with more enthusiasm. At this same time Morel and Ody in Geneva reported the right frontal lobe resection for schizophrenia. They were influenced by Cushing's statements: "The 'defrontalized' dement, deprived of one of the principal centers of psychic life, recovers his equilibrium at the price of intellectual impoverishment, but it is better for him to have a simplified intellect, capable of elementary acts, than an intellect where reigns the disorder of subtle syntheses. Society can accommodate itself to the most humble laborer, but it justifiably distrusts the mad thinker."¹⁶

In Bucharest, Bagdasar and Constantinesco reported a similar case. In neither of these was there any remarkable improvement. These cases represent

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the last serious attempts to treat mental disorders with unilateral operations on the frontal lobes.

Six months after Moniz first published his results, Freeman and Watts introduced lobotomy in the United States. In spite of emotional and rational criticism they persisted until prefrontal lobotomy became a recognized form of psychiatric therapy. One of the bitterest denunciations appeared after the operation had been taken up in other centers in this country.

"Of recent years, a type of meddlesome surgery, originally instigated in Spain, has been introduced into this country, frontal lobotomy by name.

"Lobotomy for frontal lobe malignant tumor we can understand, but by this extended lobotomy, one is supposed to be able to 'pluck from the brain a hidden sorrow.' It is claimed it can ameliorate or cure people suffering from obsessional and compulsive neuroses, and even bring restitution to the more cyclical and obstinate disorder—manic-depressive depression.

"If the cutting off of one set of frontal lobe association fibers is not sufficient, try cutting both sides, i.e., analogously, if cutting off one leg of a paraplegia does not cure the individual cut off both legs to see how that will work.

"To us the whole procedure meant for the relief of a disorder of the personality is radically wrong. Its advocates overlook entirely the functions of the brain in the make up of the personality of the individual of which the frontal lobes are but a part, and phyletically speaking but a recent acquisition of the human nervous system.

"The disorders mentioned for which there is claim of value are disorders of the entire personality, i.e., of the entire body, mental apparatus and all, and we recommend these aspirants for neurosurgical honors to read and digest Karl Menninger's remarks on polysurgical castration devices, not those of strictly phallic significance but those that maim and destroy the creative functions of a nonmutilated body.

"In the name of Madame Roland who cried aloud concerning the many crimes committed in the cause of 'liberty' we would call the attention of these mutilating surgeons to the Hippocratic oath."⁵²

The general group of persons who had the greatest difficulty accepting psychosurgery as a legitimate therapeutic measure were those with a strong psychoanalytic bias. In a discussion of a paper by Freeman and Watts, Brill made the following comments: "I cannot understand why such ideas (prefrontal lobotomy) are brought here, and much less the fantastic conclusions drawn from them by some of the discussers. . . . I feel that there is absolutely no reason why we should be impressed by the seriousness of these presentations, in spite of the fact that I highly regard the readers. I know that they are seriously trying to contribute something to science, but what

they showed is nothing but interesting experimentation."⁷

Zilboorg referred to it as medical sadism. Kisker attributed this opposition to three basic types of motivation: (1) it conflicts with one's fundamental set; (2) lack of understanding of neuro-structural and neuro-dynamic relationships and (3) (perhaps most inexcusable) insistence that the intact brain should not be tampered with at any cost. "This conception, which is at once mystical and emotional, is a tribute to the idea that the human body is somehow inviolate, and that it is sacrilegious to experiment upon it. Here, the objection approaches the blind dogma of religious conviction."³¹

In 1941 the official position of the American Medical Association was one of conservative neutrality. In an issue of the *Journal* containing a panel discussion of the subject, Fishbein editorialized that "in the present experimental stage" of the operation physicians should refrain from making public laudatory statements. "No doctor can yet assert that this is or is not a truly worthwhile procedure. The ultimate decision must await the production of more scientific evidence."¹³

The following decade saw the adoption of surgery as therapy for mental disease by numerous hospitals in all sections of the country. With Fiamberti's development of a transorbital technique and its popularization in the lay literature, the tendency was toward more and more liberal use of the operation. However, several serious and rather well-controlled studies have contributed toward standardization of indications.

It is interesting to note that the first basic or general indication, or more precisely, consideration, that is almost universally accepted is identical to that mentioned in Heinrich von Erpendora's report from the 13th century. That is, no patient should be subjected to surgical therapy unless he has not responded to all milder measures or unless it may be predicted that such milder measures will fail. The original observations of Moniz seem to have been largely confirmed over the past two decades, in that disturbed or agitated patients respond to psychosurgery better than those whose behavioral changes are not so marked. As a corollary to this, one may state that if the emotional component in the psychosis has subsided to the point where deterioration is evident, the likelihood of a successful result is remote. As a general rule, the more severe the disturbances of behavior, the more profound will be the alteration of the patient as a result of the operation.

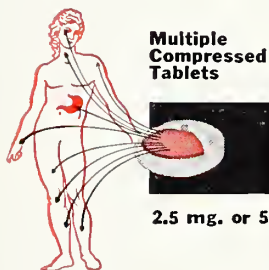
Age is a relatively unimportant factor. Modern surgical techniques have decreased the hazard of the operating room to such a point that the same general considerations are used for both young and old—whether the contemplated procedure offers

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a good chance of relief with minimal risk of complications and whether the particular individual is in sufficiently good physical condition to withstand the procedure. Usually the older patient will respond better because he is better able to maintain himself in his social environment. Duration of disease is also relatively unimportant, provided the emotional component remains severe.

Original intellectual endowment of a high order is indicative of a favorable prognosis, but even more important is a reasonable modicum of energy in the personality. Lack of this latter factor probably contributes largely to occasional appearance of post-operative lethargy or apathy. Structuralization of the psychosis or neurosis, i.e., the development of fixed and constant behavioral patterns, usually renders necessary a more extensive operation.

Most writers in the field feel that the procedure should be performed only on the recommendation of a psychiatrist, since psychiatric diagnosis and evaluation should be the determining factors. This mode of therapy is not confined to any one psychiatric diagnostic category, but, depending on the behavioral or affective manifestation of the disease, it may be effective in most if not all types. The patient who responds most satisfactorily to surgery of the brain is the "pseudoneurotic schizophrenic." The acutely and continually agitated, highly pseudoneurotic patient with obsessive and schizoid traits who has not responded to years of psychotherapy usually does well after psychosurgery. Chronic alcoholics or psychopathic patients generally respond poorly. Pool is also inclined to refuse operation in the markedly aggressive individual whose aggressive behavior is a part of his basic personality makeup, no matter how clamorous the patient, because of the frequency with which these patients express their aggression postoperatively in asocial or anti-social acts.

Organic disease of the brain is not a contraindication, per se, since the symptomatology of these patients is often strikingly benefitted by lobotomy. It must be remembered that the surgical "treatment" of mental disorders is undertaken for the relief of symptoms, and there is no good evidence at this time that the basic disease processes are essentially altered. But since external manifestations of the disease are so often improved, psychosurgery has a great deal to offer the patient whose organic damage is displayed in behavioral changes. It is through similar reasoning that one may understand why hypochondriacal complaints are overcome so easily, for here the symptoms are of the type that usually disappear after psychosurgery.

Moral issues involved in psychosurgery are difficult to resolve and, indeed, have provided a basis for some of the sharpest attacks on its use. Of recent years the

tenor of the criticism of various moralists has been that of a plea for conservatism, not a condemnation of the procedure.

"... in considering the well-being of the patient, one must consider the complete picture, the whole scale of values, and not merely one aspect. Thus a procedure which alleviates pain is a benefit to the patient; so too is a procedure which relieves the symptoms of mental illness. Yet, if such benefits are attained only at the expense of what is higher and nobler in man, his power to act as an intelligent and free being, then the law of ascending values is violated and the procedure is morally objectionable. This is by no mean a condemnation of psychosurgery, though I think it may be interpreted as a caution that psychosurgery, like other forms of surgery, is subject to the law that places the total well-being of the patient as a person above any particular benefit to the patient, as well as above any advancement in medical science which is obtained through treating the patient."³⁰

Results of psychosurgery are difficult to summarize briefly. Figures published in numerous series vary, and to the psychiatric observer do not reflect a thorough consideration of the psychiatric implications of the operation or evaluation of the basic disease process. The positive features of the personality changes include an enormous reduction of tension, fear, worry, combativeness, obsessiveness, and agitation, with a turn of attention outward and less preoccupation with morbid inner trends. On the negative side may be listed, in many persons, reduction of depth and complexity of feeling as well as drive for leadership, strong sympathies, and altruistic involvements. Convulsive seizures continue to be the chief complication with apathy, blunting or loss of initiative being further complications in patients receiving wide section.

Since the origins of human society, mental disease has been a problem confronting the healers of the race. The use of surgical techniques in therapy has been traced through the centuries. Modern psychosurgery had its inception with the work of Egas Moniz in 1935, but he was preceded and followed by many other contributors. The validity of this form of therapy seems to have been established, although contemporary medicine is still not in full agreement on the indications for its use or the basic processes by which it works.

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Smith, Kline and French Laboratories, Philadelphia, received one of four Albert Lasker medical journalism awards last month for "The March of Medicine" documentary film and live action series produced in 1955.

Non-profit general hospitals, which care for the great majority of the acute short-term cases in the nation, spent \$22.78 every day for each patient, according to the American Hospital Association's report for the year 1954. The average cost per patient stay in these hospitals in 1954 was \$171.

BOOK REVIEW

Differential Diagnosis: The Interpretation of Clinical Evidence. By A. McGehee Harvey, M.D., and James Bordley, III, M.D. Published by W. B. Saunders Company, Philadelphia. 665 pages. Price \$11.

This consists of 90 specially chosen cases from a large series of clinical-pathological conferences, carefully condensed clinical histories, physical examinations, and clinical notes, with autopsy findings restricted sharply to relevant facts. Then lengthy detailed x-ray reports and great lists of laboratory findings so often noted in clinical-pathological conference reports are pleasingly reduced to facts pertinent to the diagnosis of the case at hand.

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The National Advisory Committee on Polio Vaccine has set up the following recommendations for distribution of vaccine during the 1956 "polio year," which began on April 1:

1. That states give priority to vaccination of children under 15 years and to expectant mothers until maximum coverage has been achieved.
2. That the surgeon general of the U.S.P.H.S. allot vaccine in epidemic areas for research in the interest of evaluating efficiency of the vaccine under epidemic conditions.

3. That local option prevail in states and municipalities whether the second and third shots are given now or postponed, with resumption of the "ideal three-injection schedule" when supplies warrant.

The Illinois State Medical Society, meeting recently in Chicago, unanimously approved a resolution urging establishment of a National Library of Medicine in Chicago. A bill to move the library from Washington to Chicago has been introduced in Congress.

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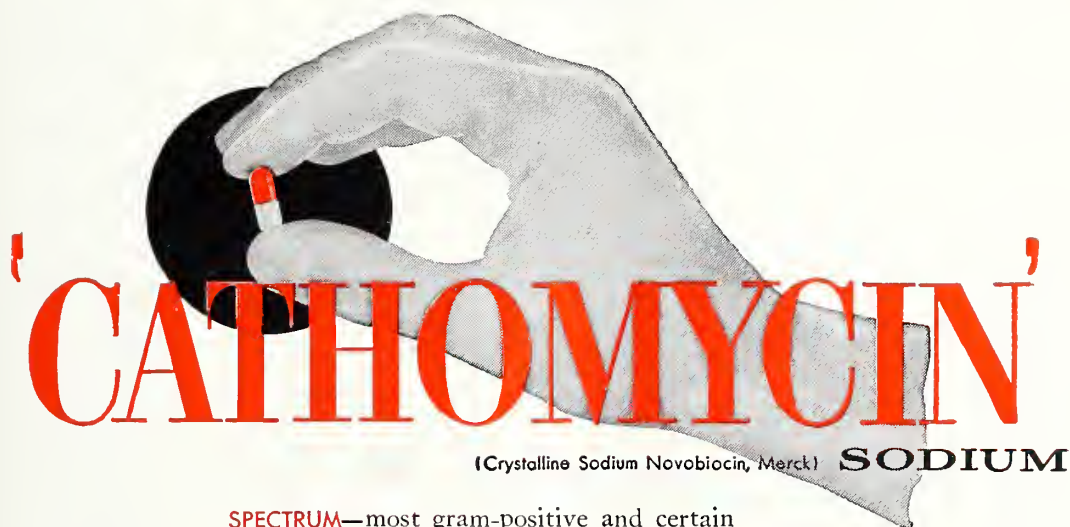
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International Research Council Incorporated

The first world-wide medical confraternity for the dissemination of knowledge concerning aphasias associated with hemiplegia, the International Research Council, was incorporated recently. The aims of the council include establishment of a clearing house for information on the subject and the publication of a monthly *Review-Bulletin*. Information may be secured from Dr. Hamilton Cameron, 601 West 110th Street, New York 25, New York.

After nearly 70 years of operating its own printing plant, the American Medical Association withdrew from that activity on July 1. The June 30 issue of the *Journal of the American Medical Association* was the last issue to roll off the Chicago press. Future issues will be printed by the McCall Corporation, Dayton, Ohio. A need for the space occupied by the printing department and the necessity of replacing old equipment contributed to the decision to make the change.

Parke, Davis and Company, it was recently announced in the *Saturday Review*, won the 1955 award for "distinguished advertising in the public interest." More than 400 advertising campaigns in magazines were screened, and 105 survived for the final balloting by 28 judges, educators, editors, publishers, re-

search analysts, and advertising and public relations executives. The Parke, Davis and Company advertisements concerned the subject of physicians' fees and advised a frank discussion between patient and doctor.

By handicapping their victims without killing them, chronic diseases have come to constitute a huge financial and emotional problem—ever increasing in size—which threatens to choke the medical economy of our communities. It is folly to regard them as solved medically until they have been eradicated. . . It is obvious that the most direct approach to the eradication of tuberculosis is to prevent tubercle bacilli from reaching human beings.—*Rene J. Dubos, Ph.D., Nat. Tuberc. A. Tr., May, 1954.*

At this moment, it is exceedingly important that the decrease in the number of new cases of clinical tuberculosis evolving and the precipitous decline in mortality are not interpreted as the approach of immediate ultimate victory over tuberculosis. Such an interpretation could play into the hands of the tubercle bacillus, which could soon again become as widespread and destructive as it was in this country fifty years ago. The phenomenal success in reducing morbidity and mortality represents a battle less than half won against the tubercle bacillus.—*J. Arthur Myers, M.D., Journal-Lancet, April, 1955.*

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TABLE OF CONTENTS

AUGUST, 1956

Scientific Articles	
Rehabilitation: Restoration of Function after Fractures Is an Important and Sometimes Neglected Feature of Their Treatment—Charles R. Rombold, M.D., Wichita . . .	467
Chest: New Problems in Pulmonary Diseases in Our Aging Population—Martin J. Fitz-Patrick, M.D., Kansas City . . .	473
Diverticulum of Duodenum: An Instance in Which a Diverticulum Produces Intestinal Obstruction—E. B. Struxness, M.D., Hutchinson . . .	480
Erythroplasia of Queyrat: An Unusual Instance in a Negro Patient Involving the Penis and Progressing to Invasive Carcinoma—D. Cramer Reed, M.D., Wichita . . .	482
Tumor Conference: Vascular Tumors of the Neck . . .	489
Senior Thesis: Ectopic Pregnancy . . .	499
Editorials	
Survey of Hospital Facilities . . .	487
Journal Style . . .	487
Refresher Courses Tax Deductible . . .	488
Miscellaneous	
President's Page . . .	486
Just Browsing . . .	485

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The JOURNAL *of the* KANSAS MEDICAL SOCIETY

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Volume LVII

AUGUST, 1956

No. 8

Rehabilitation

Restoration of Function after Fractures Is an Important and Sometimes Neglected Feature of Their Treatment

CHARLES R. ROMBOLD, M.D., *Wichita*

There are certain fractures other than those of the long bones which are frequent and which have a high potentiality of complications, a result of the physiology of the bone fracture, a mistake in diagnosis, or the inadequacy of treatment. These are fractures of the femoral neck, the carpal scaphoid, and the tarsal astragalar neck. Nonunion in these areas may occur even when both of the bone segments are viable and are capable of osteoblastic activity.

Besides nonunion another complication in these fractures is aseptic necrosis of the femoral head, of one of the scaphoid fragments, or of the body of the astragalus. Nonunion and aseptic necrosis in these fractures are a result of circulatory failure produced by the traumatic severance of the principal blood supply of the segment involved. If the blood supply is to be re-established, prompt reduction and competent immobilization of the fracture must be instituted.

Correct early diagnosis and prompt adequate treatment of these fractures has accomplished much in decreasing the frequency of nonunion and aseptic necrosis. It certainly is to be admitted that nonunion or aseptic necrosis may occur in these fractures even after there has been administered what we now consider to be the best possible care. Further improvement in the techniques of our treatment will further reduce the complication.

After nonunion or aseptic necrosis has occurred, it is possible that circulation can be re-established in these areas by a successful bone graft. However, the chance of re-establishing an adequate circulation in the necrotic area is minimal and requires many

months of time, and the possibility of obtaining a good result is further diminished by a probable collapse of the contour of the necrotic area while awaiting re-establishment of the circulation. Therefore, other means have been sought for and found to re-

This is Part II of a four-part series. Part I appeared in the July issue of the Journal, Part III will be published in September, and Part IV will be printed in October.

habilitate persons with these special fractures complicated by nonunion and aseptic necrosis.

Treatment of complications of fractures of the femoral neck dates back to the introduction of surgery in orthopedics. There probably are as many operations described in the literature of the past for treatment of this condition as there are vitamin medications available now. It is interesting to note how many birth announcements of new operations of all kinds one reads but how few demises of operations are recorded. Certainly the failure to record the demise of an operative procedure should elicit more censure than the announcement of a new one deserves acclaim. It is more fitting to pay respect in a requiem to an operation which has served its purpose and died than to welcome one newly born which has yet to prove its mettle.

Of the many procedures proposed to rehabilitate

the complication of nonunion or aseptic necrosis in fractured femoral necks, only two now are usually considered—hip fusion or the use of a hip prosthesis. The choice of procedure here depends on many factors, each operation having advantages for classes of individuals and occupations.

The advantage of hip fusion is that it provides a completely dependable, painless, effective extremity for ambulation and work. The disadvantages of hip fusion are the long period of postoperative convalescence, the long period of immobilization which frequently results in limited knee motion, the frequent failure of fusion requiring re-operation, the difficulty of dressing the foot after fusion, and the somewhat greater clumsiness of sitting and walking.

The advantages of a hip prosthesis over a hip fusion are the lessened limp, the greater mobility in sitting, the ease of foot toilet, and the short convalescence and immobilization. The disadvantages are the less assurance of complete relief of pain and occasional residual weakness.

Probably the wiser procedure is a fusion for those younger individuals whose functional requirements are for long periods of heavy work. On the other hand, a prosthetic device is the method of choice for older people or those younger ones whose occupations and avocations are sedentary.

A prosthetic device can be applied in an appropriate case with little more operative trauma than that which results from the nailing of a fractured hip. In these days of modern anesthesia and operative care, it is a rare case of hip fracture that is not amenable to the nailing operation. Therefore, even in an elderly patient a nonunion of a hip fracture or an aseptic necrosis need not condemn him to a wheel chair or crutches for the balance of his life.

The type of prosthesis used in a case of nonunion of a femoral neck fracture depends upon the length of the neck remaining. If the fracture has occurred close to the head of the femur, nonunion is frequent. Occasionally the absorption of the neck is minimal, leaving sufficient length of the neck to utilize for a cup arthroplasty. Much more frequently, however, an entire new neck of the femur must be supplied because of its absorption in the nonunion process. In these cases a prosthesis is required which will supply not only a head to replace the ununited head but also a neck to replace the absorbed neck as well. After one of these has been introduced, frequently no post-operative immobilization is required, and the patient may be ambulatory and partially weight bearing in 10 to 14 days. Results have been sufficiently satisfactory with the use of mechanically sound prostheses that some orthopedic surgeons advocate the use of prostheses in acute hip fractures, particularly when the fracture is in the vulnerable area.

We have used several types of replacement prostheses with variable results. Because some of the early poor results were due to reaction to nylon, we discarded that early. The simple heads attached to transfixing nails were discarded because of their instability. Now we use only those with a long intramedullary broach which firmly immobilizes the prosthesis, and with a collar which, seated on the shaft, carries the weight.

Aseptic necrosis of the femoral head may accompany a nonunion or be a late complication, appearing months or years before the fracture has united. This complication may be as painful and as disabling as a failure of union of the fracture, and it may require as much support for ambulation. Definitive treatment, if advisable, may be either a cup arthroplasty or a replacement prosthesis, or a hip fusion. Occasionally the necrotic area involves such a large proportion of the neck that a replacement prosthesis is required to supply a femoral neck.

If a hip fusion operation is the advisable solution to this problem, internal fixation again may be the means of saving weeks or months of cast immobilization. We have used several methods of fixing the femur to the pelvis—by plates extending along the ilium and femur, by means of a Blount plate, and by huge screws transfixing the pelvis and the femur. None of these procedures has proved altogether satisfactory, but each has been helpful in achieving earlier union by increasing the femoral-iliac fixation.

NONUNION SCAPHOID

Incidence of nonunion of fractures of the carpal scaphoid has been reduced in recent years by early recognition of the fracture. Nonunions can be further reduced by considering all wrist sprains as scaphoid fractures until proved otherwise by successive x-rays over at least a two-week period. After the diagnosis has been made, occasional cases require exceptionally long immobilization in the proper position, even for months, to achieve union.

Nonunion of a fractured carpal scaphoid with the usually associated avascular aseptic necrosis of one or both fragments frequently constitutes a severe handicap, particularly to a laborer. Pain and weakness may be sufficient to prevent the use of the hand in manual skills, such as use of a hammer, wrench, screw driver, etc., and even eliminate such functions as pushing, wringing, or turning. Because of the long time required for successful bone grafting of this nonunion (often 12 to 24 months), the frequent failure of the aseptic portion of the scaphoid to regain vitality after grafting, and the almost invariable late development of hypertrophic arthritis, wrist fusion becomes the procedure of choice. A wrist fused in the position of function results in minimal disability and interferes

practically not at all in any of the manual functions requiring either strength or dexterity. The shorter, surer convalescence and the strong extremity acquired by fusion are advantages which outweigh the possible retention of wrist motion resulting from grafting the scaphoid.

The procedure is accomplished by denuding the posterior surface of the radius and proximal carpal bones. A transplant of a strip of cortico-cancellous ilium is cut so that it will provide an extension of the wrist at about 30 degrees. This graft is held in position by screws in the radius and in the scaphoid, and a cast is applied for two, or possibly three, months. Great care should be exercised in this procedure to prevent any involvement of the distal radioulnar joint which would effect a loss of pronation and supination.

NONUNION ASTRAGALUS

A failure of union of the astragalus fracture requires an ankle fusion, a large area of contact of cancellous bone of the tibia and astragalus supplying sufficient circulation to vivify the astragalar body if the necrosis is not too extensive. If the astragalus is severely necrotic, the best choice is to fuse the tibia to the os calcis after the removal of the astragalus. The ununited but vital head and neck of the astragalus is fused to the anterior surface of the tibia and the body to the inferior surface. This results of course in shortening the leg three-fourths of an inch but in an effective weight bearing member.

NONUNION OF PATELLA

Nonunion of patellar fractures, if they cause disability, usually presents the problem of mechanical inadequacy rather than disability because of pain. Frequently even with nonunion of the patella there is neither significant weakness nor pain, and those fortunate cases may be disregarded. However, if the power of the quadriceps cannot be delivered to the tibia because of the defect in the extensor apparatus after fracture, the knee is undependable for walking and ineffective for climbing, lifting, running, etc. This is a serious handicap.

The procedure recommended to re-establish adequate function will depend upon the defect. If there are numerous areas of nonunion, all of the patella should be resected and the area from which it has been removed reinforced with a facial or tendon graft. Reinforcement may easily be obtained by a flap of quadriceps tendon which may be dissected from its muscular attachment and turned down distally to be imbricated into the patellar ligament. Occasionally only the distal pole of the patella requires resection with a similar graft replacement. When the patella lies in two large fragments, however, it is best re-

paired by freshening its surfaces, carefully aligning them, and maintaining their apposition by wire or similar internal fixation.

NONUNION OF VERTEBRAL PROCESSES

Nonunion of fractures of spinous processes or lateral processes of the vertebrae are of themselves of no clinical significance. If they are associated with other vertebral or disc pathology, it may be this which causes the symptoms but not the spinous process nonunion. In compensation cases where most symptoms of nonunion in these areas arise, a cure is obtained magically by the application of a heavy greenback poultice, and the poultice is immeasurably more effective than surgery or a brace.

MALUNION

Any fracture which unites without retaining the alignment and length normal for that bone is considered a malunion. The functional defect from malunion may vary from one which is negligible to one which is completely disabling. To enable a physician to properly advise his patient, the various factors mentioned in the introduction must be more carefully evaluated in this than in any other situation. To correct a malunion, a surgical procedure usually is required, and the value of the corrected result must be carefully considered before the patient is advised to accept the procedure. The problems presented by malunion are so varied that they cannot be considered as a whole but only singly as presented by each individual situation.

In the upper extremity, malunions of the clavicle and of the humerus, except at the elbow joint, rarely offer a problem except an aesthetic one; function and comfort are rarely implicated. Even in the elbow a large percentage of the range of flexion and extension may be lost and the result be of little functional consequence providing the remaining range is painless and that the loss is at the extremes of the ranges. Even an elbow fused in good functional position, which is any place between 80 and 135 degrees, results in little disability providing pronation and supination are not also materially lost. Therefore the mere decrease in the range of elbow motion secondary to a malunion of the bone constituents does not suggest correction providing any position between 80 and 135 degrees can be achieved. If extension is limited to less than 80 degrees, or if flexion is limited to less than 135 degrees, osteotomy of the involved bones may offer a marked improvement in function and appearance and may be a procedure of choice.

Loss of pronation or supination of the forearm may result from cross union between the radius and the ulna, from an angulation in fractures of their shafts, or from a disorganization of either the proxi-

mal or the distal radio-ulnar joints. The solution of this problem definitely is influenced by the location of the pathology and by whether the hand is in the functional pronated position or in supination.

The resection of a bone bridge between the radius and the ulna is a mechanically feasible operative procedure. However, the end results of such a resection usually are poor. The operation should be recommended only in exceptional patients such as typists, musicians, etc., whose occupations require dexterity in their forearms, in which a certain position of the forearm is mandatory and cannot be acquired by compensating at the shoulder. A guarded assurance of gaining rotatory motion may also lighten the burden of failure.

When an angulation of the shafts of the radius and ulna prevents rotatory movement in the forearm, again a major surgical procedure is required to regain movement. Osteotomy of one or both bones, with internal fixation in the corrected position, with accompanying risk of nonunion, is a formidable procedure; as one grows older in bone surgery, it seems to be a much less desirable undertaking than it did in orthopedic childhood.

On the other hand, if the malalignment exists in either of the radio-ulnar articulations, the procedure is minimal. A resection of the head of the involved radius or ulna constitutes minimal surgery with maximal results. This is particularly true in Colles' fractures which have healed with shortening of the radius and in radial deviation. Pronation and supination frequently are reduced by 75 per cent in these cases. Usually rotation can be completely restored by the resection of the relatively afunctional distal end of the ulna. At the same time a gratifying aesthetic improvement is obtained, and frequently the patient is more appreciative of the improved appearance than of the increased function.

One of the early cases in which we performed this operation so dramatized it that we have never forgotten the advantage of the procedure. This bridge-playing dowager consecrated to short sleeves, traveling in the local 400, united her Colles' fracture, in spite of my best efforts and to my dismay, in radial deviation and shortening. Her objectionable deformity, especially exposed by her short sleeves and emphasized by her obvious clumsiness in dealing her cards, initiated card table conversation which was hardly complimentary to me, her physician. However, about two years later she had what was for both of us an opportune injury. She fractured her ulna in its distal end at a most appropriate location. Upon resection of the small distal portion, without even the necessity of chiseling it, she regained complete motion

in pronation and supination and recovered a lovely outline of her wrist.

Resection of the head of the radius after union in malposition likewise gives maximal results with minimal surgery and is usually advisable. One important point to be considered is the timing. It is pretty well established that surgery in this area, in the period between one and five weeks after the injury, increases the tendency to production of myositis ossificans; therefore, the operation should be performed either before or after this period.

Another and extremely important factor to be considered is the radial nerve which winds about the neck of the radius. A division of the radial nerve results in the entire loss of active extension of the wrist and of the fingers. A loss of the extensor power of the wrist and fingers is a terrific price to pay for pronation and supination of the forearm. However, if the dissection is careful and accurate and only the head of the radius is removed, there need be little fear of radial nerve injury. The osteotomy need only result in the total removal of the radial head with a minimum of the neck of the radius, and this can be achieved with little probability of radial nerve complications.

Even though we are dealing with fracture rehabilitation, I wish to make a special point of a dislocation which frequently complicates a wrist fracture and which is frequently missed in the diagnosis. With a fracture of the carpal scaphoid there may be a dislocation of the semilunar into the flexor surface of the forearm. With every suspected fracture of the scaphoid, carefully examine the x-ray to ascertain that the semilunar and scaphoid hollow is filled with the magnum bulge. Clinically this complication must be suspected if there is paraesthesia in the median nerve distribution or an unusual interference with the function of the flexor tendon. If diagnosed early, it frequently may be reduced by manipulation. If recognized late, it always requires surgical reduction, and even its late reduction results in a considerable improvement in wrist and hand function.

MALUNION IN LOWER EXTREMITIES

Fractures united in malposition in the lower extremities constitute an almost totally different problem than similar malunions in the upper extremity. To a large extent mobility, which is the primary function of the upper extremity, can be accommodated, if decreased, by substitution of motion through some other upper extremity joint. In the lower extremity, however, where weight bearing rather than dexterity is the primary function, the mechanical problem of weight transference constitutes

the most important factor. This problem of transference of weight is further complicated by the necessity of its being accomplished through movable joints. Wear results if the two movable parts of a machine fail to fit perfectly or if the pressure is greater in one area than in another. This is equally true in a leg built for weight bearing, though unfortunately this machine contains the additional attribute of pain. Therefore the alignment which determines the weight flow through a fractured lower extremity may be of considerably greater importance than the alignment of an upper.

Acetabular fractures, unless they are simple and have been completely reduced, often give a painful and disabling result. Many of these bad results become apparent late, with the production of a hypertrophic arthritis following years of wear of incongruous surfaces. The resultant pain and disability frequently require surgical correction by either a cup arthroplasty or a fusion of the joint.

While we are discussing acetabular fractures, I wish to make a point of the treatment and also of reading the x-ray in the fresh posterior lip fracture of the acetabulum complicated by a posterior dislocation of the femoral head. Immediate reduction of the hip without any delay is essential to preserve circulation in the head of the femur. If the reduction is not immediate and complete, aseptic necrosis of the femoral head is almost a certain sequela. I believe that infrequently will simple skin traction or even skeletal traction reduce the dislocation of the hip. Almost invariably after length has been obtained, manipulation is required to force the head of the femur forward to seat it under the roof of the acetabulum. These patients are best treated, therefore, by an immediate reduction of the dislocated femoral head. This prompt reduction will probably preserve circulation to the femoral head. Even after the hip has been reduced, rarely will the posterior lip of the acetabulum fall into place. It will remain posterior and proximal, resulting in an eccentric acetabulum and an unstable hip. Then an early surgical reduction of the posterior lip with its maintenance by internal fixation can be done days later if necessary.

Healing of an intertrochanteric fracture of a femur with the neck in varus, as so frequently occurs, may result in as much as two inches shortening and a pronounced Trendelenberg limp. The shortening can be easily accommodated by a high soled shoe. Though all of the limp cannot be eradicated by this simple measure, it usually satisfies the patient's requirements. Occasionally there is indicated in a younger person an intertrochanteric osteotomy, reproducing the original fracture, then nailing it with the neck in corrected

alignment with the femoral shaft. This procedure requires a traction apparatus such as a well leg traction splint—not only to obtain length at the time of operation but to relieve the internal fixation of strain for a considerable period of time postoperatively.

Occasionally sufficient angulation occurs in a healed fracture of the lower extremity that great stress is thrown through either the knee or the ankle or both. Pain results from abnormal tension on the ligaments of the knee or ankle on the convex side of the angulated extremity each time weight is borne. Eventually sufficient stretching of the ligaments occurs to allow actual mechanical instability of the joint. Occasionally the joint becomes so unstable that it may require a brace to maintain its competence.

There is another factor productive of pain in these unstable joints aside from ligament strain. In the perfectly aligned joint, weight is transferred from one bone to another through a plane at right angles to the long axis of the leg. If the bone is angulated, however, weight is transferred through a point rather than through a plane. At this site of abnormal pressure wear occurs, and a secondary painful hypertrophic arthritis develops gradually over years of function.

A minimal angulation at the knee may be accepted, but I am unable to state in degrees how much of an angulation is possible without serious sequellae. Incidentally, I have found no author sufficiently brave, experienced, or willing to state dogmatically to what degree of angulation a leg, a knee, or an ankle will accommodate. I have felt, however, that if the plane of the joint was more than 15 degrees off perpendicular to the long axis of the leg, it was incompatible with a long range good result. Unfortunately, if the surgeon waits for symptoms to develop in the knee or ankle before correcting the angulation, he probably has waited too long for a correcting osteotomy to give a satisfactory result. It is the old story of locking the barn after the horse has been stolen. In those long standing cases where symptoms and disability indicate the need of correction, fusion of the knee or ankle is probably the best approach, though an osteotomy to reproduce adequate alignment may be beneficial.

Occasionally the articular surface of the femur or of either the proximal or distal articulation of the tibia is so thoroughly comminuted that a grossly irregular, incongruous weight bearing surface is presented to the bone with which it articulates. Little can be done for these patients except fusion of the joint. Fusion of the ankle can be accepted with equanimity because the result is functionally and aesthetically excellent. The only difficulty these people have

is walking on inclines or barefoot, and even that is minimal. We have found the best position of the foot in an ankle fusion is at 90 degrees to the long axis of the leg. Even slightly less than 90 degrees, particularly in a male, is an excellent position and allows greater freedom of gait barefoot. In a lady with higher heeled shoes as much as 100 degrees may be allowed.

It has been thought in the past that an ankle fusion required many months of time to become solid. That has been true, at least in part, because of the usual postoperative immobilization. The usual cast acted as a traction apparatus similar to a hanging cast used in the treatment of a fractured humerus. Even in a long leg cast with the knee flexed, some distraction occurred. This distracting force of the immobilizing cast resulted in delayed fusion or no fusion and can be simply obviated by anchoring the cast to a Steinmann pin transfixing the tibia. With this type of immobilization, union may be expected to be sufficiently advanced in two months to allow removal of the cast, though probably weight bearing should be delayed another month or two.

Fusion of the knee cannot be undertaken as airily as fusion of the ankle because an immovable knee results in a cumbersome, clumsy, and conspicuous extremity. A fused knee of course is superior to crutches, braces, disabling pain, or instability and is a welcome relief from these situations. On the other hand, a knee fused in adequate extension to be truly serviceable is unwieldy in sitting (as in a show or driving a car), necessitates leading with one leg on stairs, and results in a limp which cannot be concealed. Knee fusions similar to ankle fusions have in the past required long postoperative immobilization. Recently, however, with the advent of forceful coaptation, the healing period has been markedly shortened. After the surgical procedure has been performed, Steinmann pins transfix the femur and tibia, protruding widely from each side. After the cast has been applied, slots are cut in its long axis in the interval between the pins. Turnbuckles are attached to each

pin in such a manner that by tightening them constant coacting pressure can be maintained between the tibia and the femur. By this procedure the healing time may be contracted to six to eight weeks.

One of the most frequent painful and disabling fractures with about the highest percentage of poor results is the fracture of the os calcis. I am just beginning to discern, however, that probably about as large a proportion of the residual disabling symptoms are secondary to the usual treatment as are a result of the fracture itself. Generalized painful, limited motion throughout the foot, though occasionally caused by post-traumatic dystrophy, is due most frequently to a long period of cast immobilization. Long immobilization is unnecessary because there are no extrinsic or intrinsic deforming factors in a fracture of the os calcis so long as it is unweighted. A cast applied after reduction induces stiffness and soreness without offering any compensatory value. The second factor in a calcaneal fracture disability is the invariable incongruity in at least one of the three weight bearing planes of the astragalocalcaneal articulations. The third factor is the frequently present impingement of the peroneal tendons or the lateral malleolus by the extruded fragments of the comminuted body of the os calcis.

Fusion of the os calcis to the astragalus by removal of the remaining articular surfaces and packing the area firmly with cancellous bone gives good results, though frequently less than anticipated. Certainly our results have been improved recently since we have ceased immobilizing these feet with casts postoperatively. Another improvement in postoperative results has eventuated from our stapling or screwing the operated bones together, maintaining close contact of the denuded surfaces. Considering the usual improvement in function and comfort of the foot, particularly in young men, the fusion operation can be recommended.

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If we are to become the masters of science, not its slaves, we must learn to use its immense power to good purpose. The machine itself has neither mind nor soul nor moral sense. Only man has been endowed with these godlike attributes. Every age has its destined duty. Ours is to nurture an awareness of those divine attributes and a sense of responsibility in giving them expression.

—David Sarnoff

Pulmonary Problems in an Aging Population

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Within recent decades there has been a steady and gratifying increase in the life span of human beings of our civilization. This phenomenon has had a definite effect on such diverse fields as education, housing, politics, merchandising, and even entertainment. The specialty of pulmonary disease has also felt the impact of this evolution. The passing years have seen significant changes in problems posed by infectious, degenerative, and neoplastic diseases of the lungs. There is reason to believe that this changing spectrum of pulmonary pathology will continue on into the future, since the major problems outlined in this report have not been brought under control.

Tuberculosis has undergone an interesting evolution in the past half century. In this period we have experienced a gratifying decline in mortality from this disease, which has dislodged it from its former spot as the number one killer of our people. Along with this falling mortality curve there has been a lesser decline in morbidity, or prevalence of infection, in our communities. Figure 1 demonstrates that in the 40-year period, 1916-1955, the falling tuberculosis mortality and morbidity curves in the state of Kansas have been almost parallel. During this period

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TUBERCULOSIS CASE AND DEATH RATES
KANSAS, 1916-1955

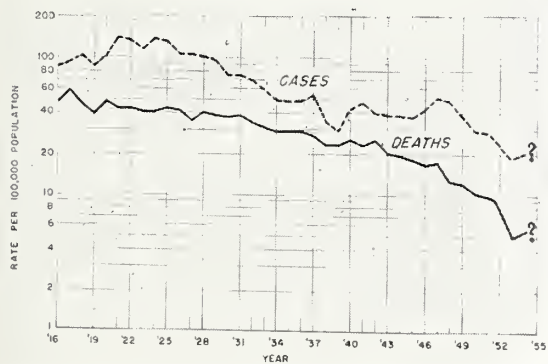


Figure 1. Tuberculosis mortality and morbidity in Kansas, 1916-1955.

Kansas has consistently had one of the lowest tuberculosis rates in the nation. A third change in the recent spectrum of tuberculous infection has been the gradual reduction in case and mortality rates in younger age groups and the growing problem of latent pulmonary tuberculosis in the aged.

The decline in tuberculosis mortality and morbidity has been accompanied by a shifting spectrum of infection. Therapy of latent tuberculous infection in the aging population is discussed. The rising incidence of chronic bronchitis and resultant crippling from pulmonary emphysema poses a problem to be solved, along with a rise in the number of primary pulmonary tumors. Two cases are reported to show the difficulty of diagnosis and treatment.

That this phenomenon had its start before the current era of antimicrobial drug therapy is demonstrated by the data in Figure 2. In this 40-year period there was a gratifying reduction in infant mortality

EVOLUTION OF TUBERCULOSIS MORTALITY
PRECEDING CHEMOTHERAPY
(UNITED STATES CENSUS BUREAU STATISTICS)

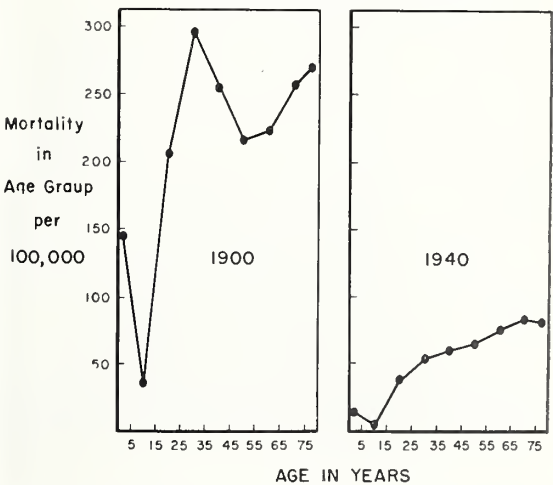


Figure 2. Shifting age groups in tuberculosis mortality, 1900-1940.

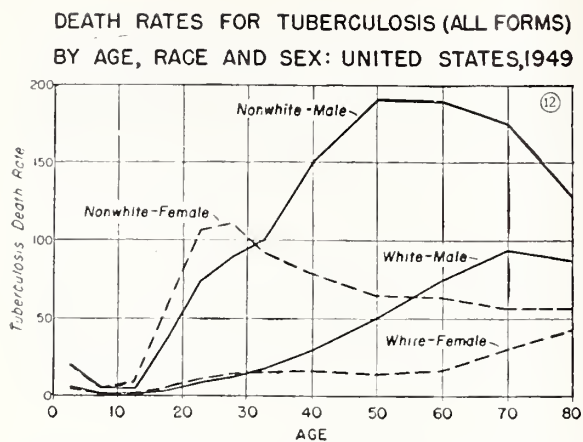


Figure 3. Tuberculosis mortality in United States in 1949 by age, race, and sex.

and in deaths from tuberculosis in the younger adult age groups. The curve of 1940 demonstrates an almost linear relationship between age and mortality in the older age groups.

However, Figure 3 suggests that on the national level racial differences are still significant in considering mortality from the disease, regardless of the shifting age picture of infection. To the young adult Negro in the United States tuberculosis is still a grave problem. The marked change in age distribution of lethal disease in the white population has made tuberculosis more a problem among older adults, particularly males.

Turning back to the state of Kansas, Figure 4* shows that in 1954 most new cases reported were concentrated between the ages of 20 and 70, with

* Data for Figures 1, 4 and 5 contributed by the Kansas Tuberculosis and Health Association.

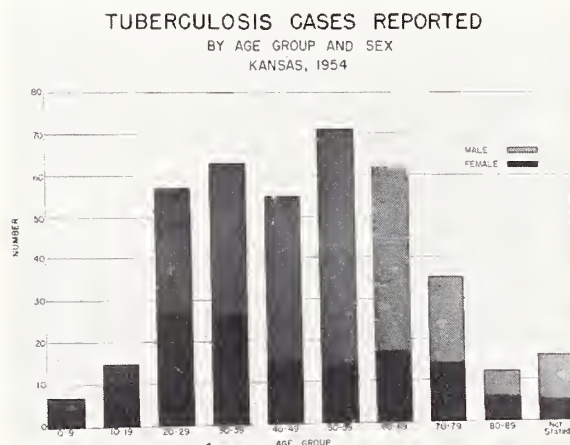


Figure 4. New tuberculosis cases reported in Kansas in 1954 by age distribution and sex.

males predominating. Figure 5 points out the problem of treating tuberculosis in this elderly group of patients. Most deaths were in patients over the age of 40. Most were male patients.

Medlar¹ has shown that in city populations the progressive reinfection lesion accounts for most deaths in patients over 50 years of age. It is this problem of recurring tuberculous infection that is encountered clinically in the aging population today. It would appear that the factor of increased exposure to infection does not adequately explain this picture, since older people tend to withdraw from active contact with others. In a sense, this group already represents the selected remnant of a generation from which the more susceptible members have been removed by death from tuberculosis or other diseases.

The fact that active pulmonary tuberculosis in

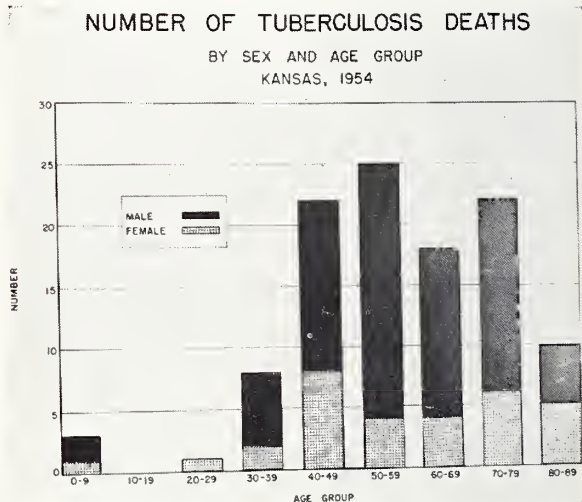


Figure 5. Tuberculosis mortality in Kansas for 1954 by age distribution and sex.

older individuals often runs a chronic and frequently asymptomatic course has led to the statement that the disease at this age is a more benign affair. The high mortality rate in patients over 40, demonstrated in Figure 5, shows that this concept is erroneous. The studies of Medlar would tend to further refute this idea. In a painstaking study of the pathology of this disease spread over many years, he was often struck by the similarity of the picture of tuberculous infection in persons in the seventh decade of life to others in the third decade of life.²

In other studies Rich, among others, demonstrated that miliary tuberculosis, a characteristic of the body with deficient resistance, tends to complicate pulmonary tuberculosis more in old age than in any other period of adult life.³ Thus it would appear that in

older people what is frequently taken for a more benign form of disease actually represents a failure of the host to respond constitutionally to the stimulus of a progressive and fatal infection. This is not so much a function of the tubercle bacillus as it is of the aging host, as has been repeatedly described in other illnesses.⁴ The fever and abdominal pain of acute peritonitis are often masked in the elderly patient, and only too late is the severity of the abdominal catastrophe realized.

It has been suggested that the increased mortality rate in older tuberculous patients is due to a general, non-specific depression of resistance to infection.⁵ Among other contributing factors, the loss of appetite and teeth, and often an inadequate nutritional intake, have been emphasized. The unfavorable effects of diabetes on resistance to tuberculosis are well known and are enhanced by the increased prevalence of this metabolic disturbance in old age.

Other diseases often accompanying the aging process, such as hypertension, arteriosclerosis, or malignancy, may add to the difficulty of controlling tuberculosis in an individual with resistance to the infection already diminished. It is frequently impossible to bring tuberculous disease in these individuals to the inactive state, and we may have to be content with a compromise. The patient approaching the end of an active and full life is sometimes reluctant to submit to a plan of treatment that is often more appropriate for the younger individual. He frequently doesn't do well in what to him seems the cold and impersonal world of the hospital or sanatorium and often seems to respond better to a program of therapy at home among familiar faces and surroundings. This can only be achieved where the home situation is a favorable one and precludes the infection of others.

It is well to emphasize that the aged uncle or grandfather with "chronic bronchitis" has all too frequently been found to be the main source of household infection to children. Any persistent, unexplained cough in this age group must be carefully investigated, particularly if children are in the home.

Thus, the aged tuberculous patient today often represents a challenge to our more successful modalities of therapy. All too frequently we are unable to use our surgical weapons, and we must fall back on antimicrobial therapy that has been robbed of its total effectiveness by the prior development of bacterial resistance. It is frequently more humane in these circumstances to gracefully acknowledge defeat and to expend our major efforts at breaking the chain of infection, giving symptomatic relief to the patient and a close scrutiny for latent infection to his family.

Turning from the problem of pulmonary tubercu-

losis to a consideration of other infections of the bronchopulmonary system, we find a rising tide of severe pulmonary disability in the older age group with its genesis in chronic bronchial infection, the familiar chronic bronchitis. There is reason to believe that increasing atmospheric pollution in certain communities, the growing industrialization of our society, and the phenomenal growth of the smoking habit are all contributing to the growing problem of chronic bronchitis in the elderly male in this country. This has perhaps been more recently dramatized by the conquest of more specific inflammatory diseases of the lungs, such as pneumococcal lobar pneumonia by newer therapeutic agents, leaving bronchitis for once exposed in its true severity.

Some idea of the problem of bronchial infection in Great Britain can be obtained by reviewing National Health Service statistics. In 1950 there were 30,000 deaths from bronchitis to the 20,000 reported from pneumonia. In that year, 16,500,000 working days were lost among the insured population from bronchitis.⁶ This represents a staggering problem in the field of pulmonary disease in the British Isles, and there is great concern that this country may be heading down the same path.

The pulmonary emphysema which frequently accompanies bronchitis typically attacks the adult male wage earner and tends to be progressive in its course. In the United Kingdom it is reported to be five times more common in urban than in rural communities, most frequently attacking the laboring man. There is reason to believe that bronchitis can be reversed if detected in time and treated energetically. But by the time symptoms of emphysema have appeared, it is most difficult to arrest the process permanently by any method of therapy known today. The usual result is a slow but steady evolution to the state of a pulmonary or cardiac cripple.

The profound physiological disturbances of emphysema on lung volumes, ventilation, distribution of inspired air, respiratory gas exchange, and vascular components of the lung materially add to the risk of intercurrent pulmonary infection in the older patient. The hazards from biochemical imbalance secondary to relatively mild infections in these patients have been carefully and fully described by many authors.^{7, 8} This combination of respiratory acidosis and cor pulmonale greatly adds to the difficulty of treating many elderly males today and is often the limiting factor in obtaining proper surgical treatment of pulmonary tuberculosis or bronchogenic tumors.

The marked increase in incidence of primary lung cancer in the past 50 years continues to alarm students

of the disease. This rising curve of pulmonary cancer mortality is in marked contrast to the steadily declining death rate from tuberculosis; it points to one of the most challenging problems today in the field of preventive medicine and early diagnosis.

That efforts in treating this disease have been totally inadequate so far is demonstrated by the low rate of five-year survivals reported from major thoracic clinics. It is a fairly common experience of those treating this group of patients to have to compromise on indicated radical resection in the elderly male, to prevent him from dying of pulmonary insufficiency. If there is any place for palliative resection in treating bronchogenic carcinoma, it would appear to be in this age group.

The problem of pulmonary disease in our aging population has been expanded and also complicated by the more recent recognition of the role of fungi in causing disease of the respiratory system. In the middle western area of this country it has explained the paradox of pulmonary calcifications in tuberculin negative healthy people encountered every day in the practice of medicine.⁹ At last the riddle of several explosive epidemics of pulmonary disease has been solved, and much has been learned about the mode of transmission of fungus infection.¹⁰ More recently, patients with cavitary, chronic, pulmonary histoplasmosis have been found in our sanatoria in this part

of the country with disease masquerading as pulmonary tuberculosis.¹¹

It now appears that these two entities are indistinguishable by chest roentgenography, and a proper differentiation can be made only by cultural techniques. All of this newly found knowledge has pointed out the need for a more meticulous study of the elderly patient with chronic pulmonary disease.

CASE REPORTS

The case histories of two patients will be presented to illustrate some of the points raised thus far. The first patient illustrates many of the problems encountered in correct diagnosis and therapy of an elderly male with diminished pulmonary reserve.

L.L., a 62-year-old white male, was admitted to the University of Kansas Medical Center in June 1955, for evaluation of a pulmonary problem. He had worked for many years in the soft-coal mines of southeastern Kansas and had noted a chronic mildly productive "cigarette cough," with wheezing, for most of his adult life. In recent years he had further noticed the insidious onset and progression of exertional dyspnea.

Six weeks prior to admission he noted the rather sudden onset of severe right chest pain, radiating into the back, and a marked increase in dyspnea with a bubbling sensation noted in the right chest on

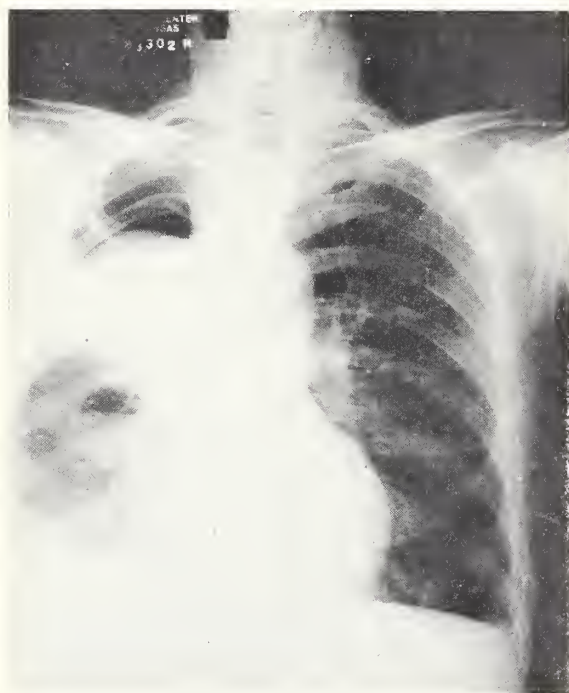


Figure 6a. (L.L.) Admission PA roentgenogram. Hydropneumothorax on right with contracted right upper lobe.

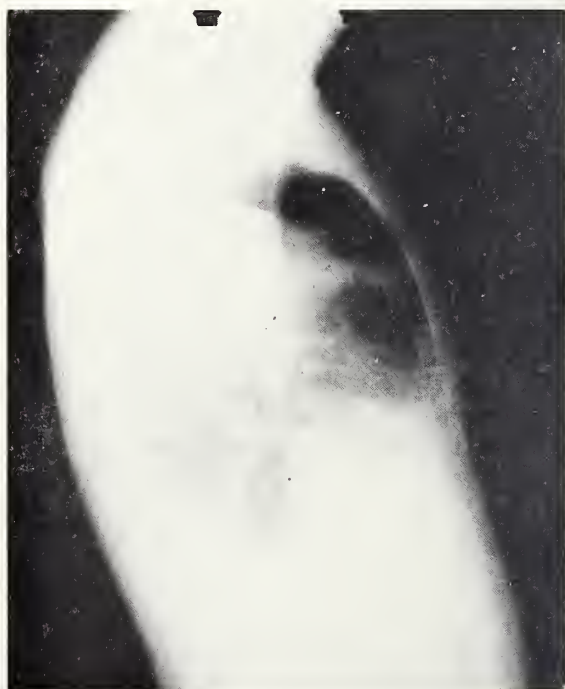


Figure 6b. (L.L.) Admission right lateral roentgenogram. Findings similar to 6a.



Figure 7. (L.L.) Frontal planogram through mid-portion of chest. Demonstrates dense right upper lobe with abscess at periphery and pneumothorax.

bending over. At this time he was raising approximately one ounce of purulent, non-foul sputum each day. His physician noted a right pleural effusion. Thoracentesis was performed three times, and each time the fluid removed was yellow and clear. In all, several liters were removed in a period of one month prior to hospitalization. During this time the patient received many different antimicrobial agents but failed to improve.

On admission he looked chronically ill, and his chest findings were those of a right sided hydropneumothorax with pulmonary insufficiency. Chest roentgenograms (Figures 6, 7, 8) confirmed this and also demonstrated a dense, contracted, right upper lobe. Numerous diagnostic studies were carried out. Pertinent findings were: chronic bronchitis on endoscopy with questionable narrowing of right upper lobe orifice; pleural transudate containing 8,000 red cells and 300 white cells, the majority of which were lymphocytes; cells reported as malignant recovered from pleural fluid and from bronchial fluid aspirated from the right upper lobe; reduction of maximal breathing capacity to one-half the predicted value; and, finally, a normal electrocardiogram.

A consulting surgeon felt that an exploratory thoracotomy to prove the diagnosis, with the hope of doing a limited palliative resection to control pulmonary suppuration, was in order. The patient and his

family were so advised and they, too, requested surgical exploration.

At surgery, it was felt that bronchogenic carcinoma was arising in the right upper lobe with involvement of the middle lobe and extensive inflammatory thickening of the visceral pleura. Accordingly, an upper and middle lobectomy, with decortication of the lower lobe, was carried out. Examination of the resected lobes of the lungs disclosed a squamous cell carcinoma arising from the right upper lobe bronchus with multiple areas of abscess formation distal to it. Figure 8 shows a typical high power section of the tumor.

The patient had a stormy postoperative course, with retained pulmonary secretions requiring repeated aspirations through a bronchoscope, and ultimately a tracheostomy, to maintain an adequate airway. During this time he developed pulmonary edema with auricular fibrillation. This was successfully treated with digitalis, oxygen, and other measures. The patient gradually improved and left the hospital three weeks after resection.

This patient illustrates many of the difficult problems encountered in treating patients in this age group. In addition to a malignant tumor, he had crippling chronic bronchitis and pulmonary emphysema. This was vigorously treated with intermittent



Figure 8. (L.L.) High power section of tumor showing typical epidermoid carcinoma, arising from bronchus.

positive pressure breathing and Isuprel® three times daily preoperatively, which resulted in a gratifying diminution in cough, sputum production, and pulmonary rales and wheezing.

Pulmonary function studies following this program demonstrated a reduction in airflow obstruction and an overall increase in total lung function. Surgery was deliberately postponed in this case until it was felt the patient was in optimal condition. Following operation, in spite of close attention to oxygen concentration and humidity, to ventilation both spontaneous and mechanical with a pressure breathing unit, and to the maintenance of an adequate airway, the patient rapidly went into pulmonary and cardiac failure and almost died.

We have learned, from experiences such as this one, that early tracheostomy is almost mandatory in this type of patient and that it should usually be done before the patient leaves the operating room. Intermittent positive pressure breathing therapy has been of great assistance in this type of patient, both in preparation for surgery and in providing adequate ventilation and bronchial drainage in the critical postoperative period. The recent development of properly fitting plastic adaptors, connecting pressure breathing units with tracheostomy tubes, has greatly facilitated proper ventilation of the postoperative patient with a tracheostomy. This has hastened re-expansion of lung on the operative side and prevented development of pleural space complications.

The emphysematous patient with a low, immobile diaphragm will often show a slight but gratifying increase in ventilation during this critical period from pneumoperitoneum. This reversible procedure is even more effective in enabling this type of patient to cough and cleanse the base of his lungs in a more effective fashion. Pneumoperitoneum has been found to be of further value in reducing the residual pleural space following resection and aiding in its early obliteration.¹²

Pneumoperitoneum, if used for this purpose, should be initiated while the patient is in the operating room. The volume of air used does not have to be as large as for the tuberculous patient. It generally can be discontinued in a few weeks, unless the patient's comfort suggests that it be continued for a longer period of time. It is in the pre-operative management and postoperative care of these patients with borderline cardiac and pulmonary reserve that close cooperation between the surgeon and internist is of greatest importance.

The problem of establishing the correct diagnosis in the elderly patient with pulmonary disease may often be a difficult one. Frequently other disabling illnesses, such as arthritis, cardiovascular disease, or

senility, limit the scope of our diagnostic efforts. In addition, the elderly patient is often unable to recall accurately specific details of earlier illnesses, which might be of great help in putting one on the right track. The increasing pattern of travel in all of our citizens both young and old has caused us to change some of our ideas about disease entities formerly thought of as problems of other areas and countries. This gradual decline in regional "diagnostic isolationism" has had the happy effect of sharpening our wits in the recognition of many new and fascinating problems right in our own back yard. The following patient's story demonstrates the need for a detailed analysis of the individual problem. It is being reported elsewhere in greater detail.

W.G., a 60-year-old white male, was admitted to the University of Kansas Medical Center in December 1954 for evaluation of a pulmonary problem. His history disclosed that he had lived in California, in an area endemic for *Coccidioides immitis*, some 30 years before. He had also worked for a number of years on a hard rock drilling crew in the mountains of California, where he was heavily exposed to silica dust. From that time on he had had "spots on his lungs" demonstrated by chest roentgenograms at frequent intervals, but he felt well.

Since then he had lived in many sections of the United States, and in Missouri for the preceding five years. In April of 1954 he was hospitalized at the

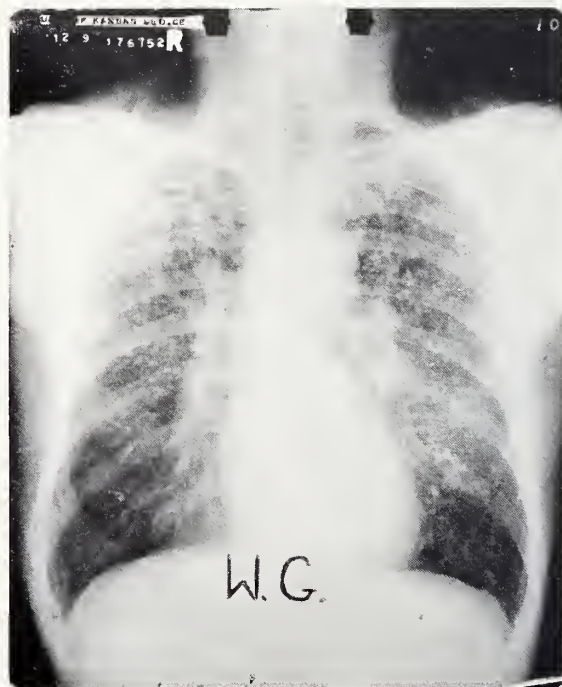


Figure 9. (W. G.) Admission PA chest roentgenogram. Demonstrates widespread fibrocalcific nodules with radiolucent area in right upper lobe.

Missouri State Tuberculosis Sanatorium because it was strongly suspected that he had active pulmonary tuberculosis. Work up at that time disclosed a chest roentgenogram similar to that seen in Figure 9, with a negative tuberculin and a positive histoplasmin skin test. Six sputum smears and cultures failed to demonstrate tubercle bacilli. He was discharged and told he did not have active pulmonary tuberculosis.

Our findings eight months later confirmed the negative tuberculin, but the patient was found to have a positive coccidioidin in addition to the positive histoplasmin skin test. Histoplasma complement fixation test was negative, but coccidioidal complement fixation test was positive in 1:8 dilution. Lamino-grams in the frontal plane disclosed a thick walled, 2-centimeter cavity in the right upper lobe (Figure 10).

Multiple diagnostic studies were carried out at this hospital, including a lung biopsy. The microscopic section shown in Figure 11 failed to reveal silica, fungi, or mycobacteria on prolonged searching utilizing appropriate staining technics. The nodules were composed of dense masses of collagen with surrounding fibroblasts and little cellular reaction. No etiologic agent, bacterial or fungus, could be recovered from these nodules by multiple cultural techniques or animal inoculation. Shortly after the patient was discharged, repeated sputum studies dis-



Figure 11. (W.G.) Lung biopsy. High power section of typical fibrocalcific nodule. Note dense central fibrosis with circular arrangement of fibroblasts about periphery.



Figure 10. (W.G.) Frontal planogram through posterior portion of right upper lobe. Note thick walled cavity.

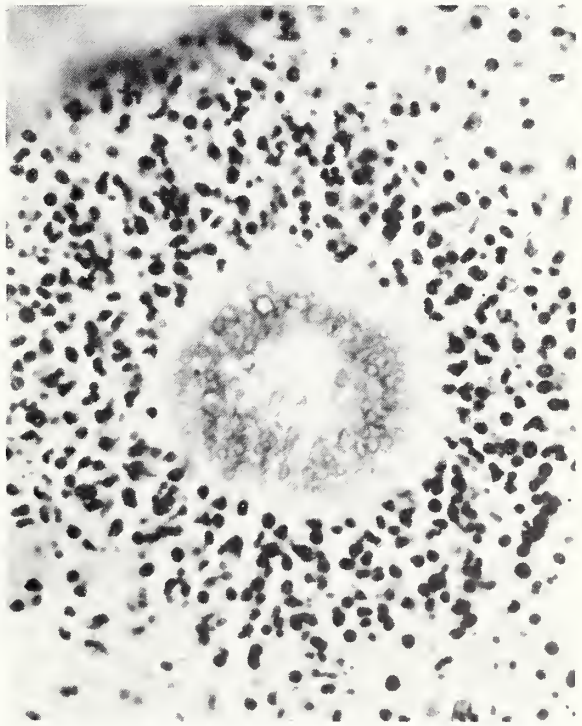


Figure 12. (W.G.) Section from mouse liver following inoculation with patient's sputum. Note inflammatory reaction.

closed characteristic spherules of *Coccidioides immitis* on direct smear. Mouse inoculation of sputum produced the characteristic lesions of endosporulating spherules, one of which is shown in Figure 12.

This, then, is an elderly male patient, once suspected of having active pulmonary tuberculosis, who has chronic cavitary pulmonary coccidioidomycosis. He is discharging fungi in his sputum from the cavity in his lung into the soil of Missouri, which is already teeming with histoplasma. In addition he has a disseminated, but healed, pulmonary infection, the exact cause of which will probably never be known. He responds to histoplasmin but has a serologic titer suggesting continued coccidioidal infection. At present the patient is home, in charge of a tourist camp, and considers himself well.

The complex problem of mixed infections in this patient clearly points out the need for a meticulous study of the many interesting and unusual pulmonary problems we will encounter in our aging population.

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Diverticulum of Duodenum

An Instance in Which a Diverticulum Produces Intestinal Obstruction

E. B. STRUXNESS, M.D., *Hutchinson*

Since Case¹ in 1913 first demonstrated duodenal diverticula in the living by fluoroscopy, conclusions as to their incidence, etiology, and symptomatology have accumulated in the literature.

The reported incidence varies from below 1 per cent to 22 per cent, depending on variations in the technique of demonstration and whether or not the examinations are done radiologically or at post-mortem.

Although the etiology is not certainly established, most observers feel, since this is largely a disease of the later decades of life and since most diverticula originate from the mesenteric border, that they are the result of mechanisms similar in all pulsion-type diverticula.

There is no symptom complex characteristic enough to make possible a clinical diagnosis. Symptoms, when present, are a function of the size and location of the diverticulum. Spriggs and Marxer¹⁰ reported symptoms in 47 per cent of their series, for the most

part resembling vaguely those of duodenal ulcer. Greenler and Curtis⁵ conclude from their survey of reported cases that symptoms are protean enough to follow gastric, duodenal, pancreatic, biliary, intestinal, or colonic patterns. Mahorner⁷ states that probably 98 per cent of duodenal diverticula do not cause symptoms, but, of those that do, pain is by far the most common complaint. Nausea, emesis, weight loss, diarrhea, jaundice, pancreatitis, peritonitis from

Duodenal diverticula usually present no symptoms of diagnostic character. In selected patients diagnosis is possible prior to surgery by x-ray examination. The patient discussed here suffered small bowel obstruction following extrusion of an inspissated mass of intestinal contents formed in a duodenal diverticulum.

perforation, hemorrhage, and even malignant change have been reported.

Morton⁸ in 1940 and Patterson and Bramberg⁹ in 1951 reported a total of 84 cases of duodenal diverticula that have been operated upon because of severity of symptoms and complications. Patterson and Bramberg⁹ concluded that the surgical approach to the problem was more advantageous than complacency under the guise of "clinically asymptomatic." Cattell and Mudge³ advocate a conservative attitude, but they also point out that diverticula may be a source of serious disability. There is unanimity of opinion that, of the symptomatic diverticula, those of peri-vaterian location can be most serious problems, the surgical solution of which is not entirely satisfactory.

CASE REPORT

The following case report illustrates an unusual additional complication which can occur as the result of a large duodenal diverticulum.

Mrs. R. R., a white female aged 74, stated that on the evening of February 14, 1956, she suddenly developed severe, generalized, colicky, abdominal pains. Shortly thereafter she became nauseated and vomited. Pain, nausea, and emesis were progressive in intensity until she was first seen at nine o'clock that evening.

In reporting her past history she mentioned complaints of mild distress after meals with excess gas and belching and a relatively poor appetite.

Examination revealed an acutely ill, elderly female, writhing in pain. The abdomen was board-like. Tenderness and rebound tenderness were generalized with a suggestion of increased tenderness in the periumbilical area. Examination of heart and lungs revealed nothing abnormal, and pelvic examination

was not remarkable except for the fact that motion of the uterus elicited pain. A scout film of the abdomen revealed nothing characteristic of intestinal obstruction. Urine and blood examinations were within normal limits. Opiates given on admission to the hospital served only to quiet the patient partially, without in any way halting the progression of symptoms.

Exploratory laparotomy was carried out. The salient findings were present in the small intestine. At a point 35 inches from the ligament of Treitz there was found a mass firmly impacted in the lumen of the bowel. The bowel proximal to this intraluminal obstruction was dilated, edematous, and hemorrhagic, while the distal bowel was normal in appearance. Resection of the impacted segment was carried out, utilizing an end to end anastomosis.

Examination of the specimen revealed that the impacting mass was made up of inspissated bowel contents which measured 5 x 4 x 3½ centimeters. The bowel wall in the immediate vicinity was beginning to undergo localized gangrenous change.

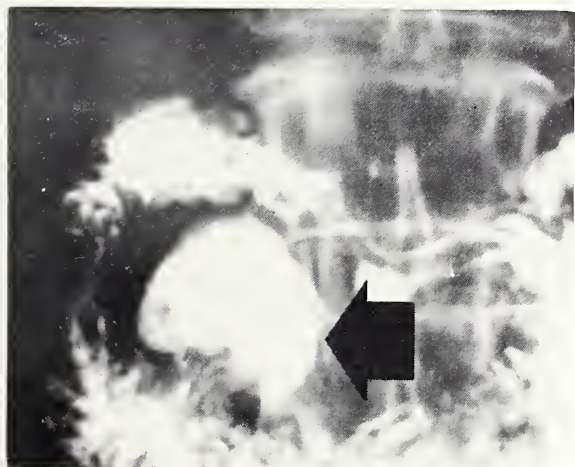
The patient had an uneventful postoperative course, and, as soon as it was feasible, she was subjected to a gastrointestinal series of x-rays in an effort to localize the source of the obstructing mass. The accompanying illustration demonstrates a mushroom shaped duodenal diverticulum of a size compatible with the specimen.

In reconstructing the events of this patient's history, I believe that this represents a case of intraluminal jejunal obstruction by the inspissated contents of a large duodenal diverticulum, which had been extruded into the duodenum and forcefully propelled as far as bowel diameter would permit.

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Spot film of the duodenum illustrating the large mushroom shaped diverticulum.

Erythroplasia of Queyrat

An Unusual Instance in a Negro Patient Involving the Penis and Progressing to Invasive Carcinoma

D. CRAMER REED, M.D., *Wichita*

Because erythroplasia of Queyrat is usually localized to the penis, most attention has been paid to it in urologic and dermatologic literature. Since the lesion is frequently first encountered by the family physician, he should be acquainted with the clinical aspects of this disease, especially with its malignant potentialities.

Erythroplasia was originally described in 1893 by Fournier and Darier¹ and popularized by Queyrat² in 1911. It has been considered relatively rare, but the fact that the 261st and 262nd cases were reported respectively by Merricks and Cottrell³ and by Friedman⁴ in 1953 suggests that the disease is more prevalent than was formerly thought or that it has recently been given greater notice because of more accurate diagnosis. That both these assumptions may be correct is attested to by the fact that during the 15 years after Sulzberger and Satenstein⁵ reported the first case in the United States in 1933, approximately 60 additional cases have been described. Most of these reports are to be found in the proceedings of various American dermatological societies where the cases were presented as diagnostic or therapeutic problems. Since 1948 approximately 25 additional cases of erythroplasia have been described.

This disease is apparently rare in Negroes inasmuch as a review of the literature has revealed only three cases,^{6,7} none of which progressed into invasive carcinoma. Smith and Hughes⁷ stressed that while precancerous dermatoses are relatively uncommon among Negroes, erythroplasia should be considered in the differential diagnosis of eczematoid lesions of the glans penis in this race. This is important because erythroplasia may develop into frankly invasive carcinoma as exemplified in the following case report.

CASE REPORT

F. M., a 56-year-old Negro, was first seen on February 10, 1949, in the Accident Ward of the Graduate Hospital of the University of Pennsylvania because of his inability to void. The patient had been treated for 20 years with intermittent urethral dilations for stricture. His past history was pertinent in that he had gonorrhea initially at age 21 with at least five subsequent reinfections. In 1939 he received "arm and hip" shots for positive serologic reactions.

He also had been treated for lymphogranuloma venereum.

Examination on admission revealed a red plaque on the glans penis approximately 2.5 cm. in diameter. The plaque was firm, indurated, shiny, velvety, and erythematous, involving part of the external meatus and frenulum. There was left inguinal, non-tender lymphadenopathy. Scarring was noted over both inguinal regions, the sites of previous buboes. A physician had recently advised no treatment for the lesion on the glans penis.

Erythroplasia of Queyrat is an uncommon and poorly understood disease which is being recognized more often. The case presented is especially unusual in that it occurred in a Negro. Treatment should be definitive because of the precancerous nature of the disease. The sequelae of improper treatment are clearly presented.

A biopsy specimen of skin taken from the lesion on the glans revealed a thin parakeratotic layer, acanthosis of the rete with broadening and rounding of the pegs. Within the rete there were several anaplastic areas showing variability of epithelial cell size, Bowenoid type cells, and individual cell keratinization. There were many abnormal mitoses. Intraepidermal edema, hydropic degeneration of the basal cells, and a few polymorphonuclear cells were noted (Figure 1). This was interpreted by Dr. Howard Beerman, professor of dermatology, Graduate School of Medicine, University of Pennsylvania, as Bowen's disease, intraepidermal cancer.

The patient was presented at the Philadelphia Dermatology Society meeting in April, 1949, and the diagnosis of erythroplasia of Queyrat received unanimous concurrence.

Surgical excision was advised but was refused by the patient who was also attending cardiac clinic because of hypertensive cardiovascular disease. A course of nearsphenamine soaks was instituted as recommended by Sachs and Sachs.⁸ This form of treatment was continued for 41 weeks at the patient's insistence, in spite of a slow progression in the size of the lesion. In August 1950, podophyllin in tincture of benzoin



Figure 1

was applied to one-half of the lesion three times weekly. The treated side showed improvement as manifested by the development of a smoother appearance. However, when the entire lesion was painted with podophyllin an inflammatory reaction appeared, necessitating termination of treatment.

Subsequently the patient absented himself from the university clinics for approximately two and a half years. Then he was again seen and subsequently admitted to the Graduate Hospital in January 1953 for circumcision because of severe phimosis and contracture of the redundant penile prepuce. At that time the erythroplasia had progressed, involving the entire glans and a portion of the corona. Amputation of the penis was recommended but was again refused by the patient.

Biopsy examination of tissue removed from the lesion at time of circumcision was reported as intra-epidermal carcinoma. The specimen showed abrupt transition from normal, deeply pigmented squamous epithelium to a less pigmented, intensely hyperplastic, densely cellular epidermis. There was also loss of differentiation and marked mitotic activity. Chronic inflammatory infiltration of the subjacent tissue was noted, but there was no evidence of malignant invasion.

In December of 1953 there was no significant clinical change, and the patient was induced to have a simple penile amputation performed 2.5 cm. proximal to the lesion. Lymph node dissection was not performed because of the patient's poor cardiac status. Postoperative recovery was uneventful.

Histopathologic examination of the resected specimen revealed an infiltrating squamous cell carcinoma (Figure 2). The sections showed anaplasia, and in

some areas the epithelium was characterized by extreme pleomorphism, poorly defined cell boundaries, and large hyperchromatic nuclei exhibiting frequent atypical mitosis. The epithelium contiguous to areas of frank invasion showed increased cellularity and crowding of deeply stained nuclei. The superficial stroma was the site of an infiltration of numerous lymphocytes and plasma cells.

When the patient was last examined in May 1955, he presented no evidence of recurrence. The previously noted bilateral inguinal lymphadenopathy was greatly reduced, and the patient was symptom free except for his chronic dyspnea and posterior urethral stricture.

COMMENT

The cause of erythroplasia of Queyrat is unknown. The postulate that it is associated with syphilis is lacking in clinical proof and is no longer widely ascribed to in this country. There has been considerable disagreement concerning the malignant potentialities of this disease. Whether erythroplasia should be characterized as a precancerosis, a Bowenoid lesion, or by any other descriptive term indicative of cancer appears academic since there is still much controversy relative to the actual pathogenesis of malignancy; the consensus today favors the belief that Queyrat's erythroplasia is a premalignant lesion and therapy should be applied accordingly.⁹

McCrea,¹⁰ LaRocco,¹¹ Rosen,¹² and others have described the difficulties encountered in making an accurate diagnosis of erythroplasia in each case without the aid of biopsy examination. The dermatoses with which erythroplasia is most frequently confused are: psoriasis, lichen planus, syphilis (primary and

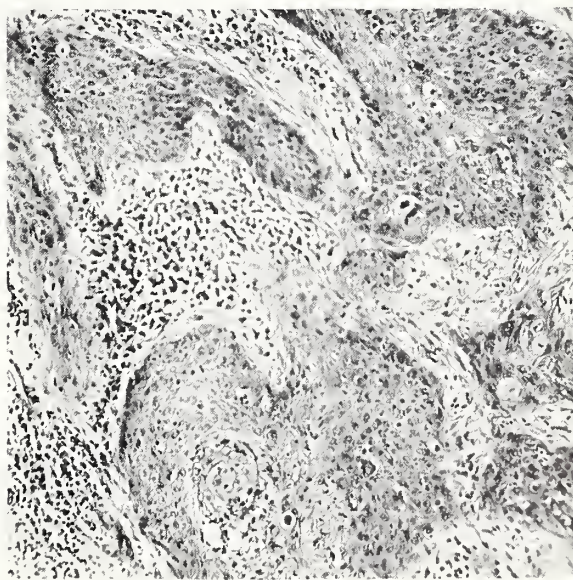


Figure 2

secondary), granuloma inguinale, contact dermatitis, seborrheic dermatitis, dermatitis medicamentosa, diabetic dermatitis, recurrent herpes, and squamous cell carcinoma. Less frequently encountered conditions such as sarcoid, lupus erythematosus, and tuberculosis of the skin must also be differentiated. This case points out the necessity for performing a biopsy on all lesions that clinically appear to be erythroplasia, and the necessity for cooperation between clinician and pathologist to assure procurement of biopsy material from the optimum site and performance of serial sections if indicated.

Although the glans penis is most often affected by erythroplasia of Queyrat, the disease is by no means limited to the genitalia. It has been reported in the perianal region, on the buccal mucosa, the tonsils, the tongue, the cheeks, and the thighs. This dermatosis is infrequently diagnosed in women, involving the vulva and cervix.¹³

Contrary to the treatment recommended in earlier literature, there now seems to be little excuse for the employment of topical applications or measures designed to accomplish less than complete destruction of the lesion. The literature is replete with references to the consistent failure of external roentgen therapy, interstitial irradiation, sodium arsenate, and bland protective ointments.

Except for the patient's refusal to permit any type of surgical procedure, there is admittedly no justification for continuing local applications for 41 weeks in our case. Electrocoagulation and electrodesiccation have been successfully employed in the destruction of early lesions, but it is preferable to employ these methods in elderly individuals since they usually result in considerable deformity and loss of sensation. Local excision, even with involvement of the glans penis, can be done with less morbidity and disfigurement. In advanced or recurrent cases where the lesion cannot be completely excised locally, simple or radical penile amputation is mandatory, depending on the proximal extension of the lesion. There are those who recommend radical inguinal lymph node dissection where the lesion has become invasive.

SUMMARY AND CONCLUSIONS

A case of erythroplasia of Queyrat followed for six years in a Negro, progressing into infiltrating squamous cell carcinoma, is reported. The failure of inadequate local treatment to eradicate the disease is demonstrated. Twenty-four months following simple penile amputation there has been no evidence of recurrence.

This disease has been neglected and apparently was unrecognized in this country until the last 25 years. It is of sufficient importance as a precancerous lesion to warrant publication of information about new cases until the general medical profession becomes familiar with its nature and appearance.

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In their essence there can be no conflict between science and religion. Science is a reliable method of finding truth. Religion is the search for a satisfying basis for life. . . . Yet a world that has science needs, as never before, the inspiration that religion has to offer. . . . Beyond the nature taught by science is the spirit that gives meaning to life.

—Arthur H. Compton



No introduction could add to the beauty of the following little essay, "What Is a Girl," written by Alan Beck. It is on the way to becoming a classic in American literature.—O.R.C.

Little girls are the nicest things that happen to people. They are born with a little bit of angel-shine about them and though it wears thin sometimes, there is always enough left to lasso your heart—even when they are sitting in the mud, or crying temperamental tears, or parading up the street in mother's best clothes.

A little girl can be sweeter (and badder) oftener than anyone else in the world. She can jitter around, and stomp, and make funny noises that frazzle your nerves, yet just when you open your mouth, she stands there demure with that special look in her eyes. A girl is Innocence playing in the mud, Beauty standing on its head, and Motherhood dragging a doll by the foot.

Girls are available in five colors—black, white, red, yellow or brown, yet Mother Nature always manages to select your favorite color when you place your order. They disprove the law of supply and demand—there are millions of little girls, but each is as precious as rubies.

God borrows from many creatures to make a little girl. He uses the song of a bird, the squeal of a pig, the stubbornness of a mule, the antics of a monkey, the spryness of a

grasshopper, the curiosity of a cat, the speed of a gazelle, the slyness of a fox, the softness of a kitten, and to top it all off, He adds the mysterious mind of a woman.

A little girl likes new shoes, party dresses, small animals, first grade, noise makers, the girl next door, dolls, make-believe, dancing lessons, ice cream, kitchens, coloring books, make-up, cans of water, going visiting, tea parties, and one boy. She doesn't care so much for visitors, boys in general, large dogs, hand-me-downs, straight chairs, vegetables, snow suits, or staying in the front yard. She is loudest when you are thinking, the prettiest when she has provoked you, the busiest at bedtime, the quietest when you want to show her off, and the most flirtatious when she absolutely must not get the best of you again.

Who else can cause you more grief, joy, irritation, satisfaction, embarrassment and genuine delight than this combination of Eve, Salome and Florence Nightingale? She can muss up your home, your hair and your dignity—spend your money, your time and your temper—then just when your patience is ready to crack, her sunshine peaks through and you've lost again.

Yes, she is a nerve-racking nuisance, just a noisy bundle of mischief. But when your dreams tumble down and the world is a mess—when it seems you are pretty much of a fool after all—she can make you a king when she climbs on your knee and whispers, "I love you best of all!"

PRESIDENT'S PAGE

Dear Doctor:

The new health care program for dependents of servicemen goes into effect on December 8, 1956. It will be operated nationally by the Department of Defense, but there are several things the Kansas Medical Society must do long before that date in order to participate in this federal venture.

Within six weeks from now as I write this, or by the middle of September, we must designate an agent and submit a fee schedule for this program. The agent may be our state society or perhaps Kansas Blue Shield. It is my personal belief that the Blue Shield office could more readily adapt itself to this extra work than could our central office where additional equipment and personnel would be needed.

We have many fee schedules to choose from including three which were approved by our Fee Schedule Committee. We also have a Veterans Administration schedule, a Workmen's Compensation schedule, and a Vocational Rehabilitation schedule. Any one or parts of several or a totally new schedule may be submitted, as we prefer.

However, we have just six weeks, so I propose to have the Fee Schedule Committee give us a single recommended schedule for this program. I will then ask the Council to approve it and immediately thereafter will call a special session of the House of Delegates for adoption of the Kansas plan.

You should know this is a fee for service program federally paid for some two million military dependents whose family income, in 63 per cent of cases, is less than \$3,300. So please consider what we should do. Talk it over among your colleagues and give us the benefit of your views. I will most sincerely appreciate your advice.

Fraternally,

Clyde H. Miller M.D.

President

EDITORIAL COMMENT

Survey of Hospital Facilities

Are there enough hospital beds in Kansas? Are the hospitals and nursing homes well located in the different parts of the state? How many long-term patients are in acute hospital beds only because there are no other satisfactory places in which they can receive care? How realistic are the service areas outlined in the state plan for hospital and nursing home construction? If we build more hospitals in rural areas, can enough nurses and other trained staff be found to work in them?

Physicians have not been alone in raising these questions, but the money needed for a study to obtain the answers has not been available until now. Recently, however, Community Studies, Inc., of Kansas City, Missouri, a private, nonprofit research group, has received a large grant to conduct such a study in the state of Kansas and in a large part of Missouri. Community Studies wants the advice and assistance of practicing physicians in planning and carrying out this study and has asked the Kansas Medical Society about obtaining such assistance.

The main objective of the study is to determine the needs of the region for beds in general hospitals and chronic disease facilities, including nursing homes, with especial attention to the needs of the chronic and aged sick.

The study will be carried out in four stages, and the first two will be of direct interest to Kansas physicians. In the first stage, a trained interviewer will visit each hospital in the state to learn the characteristics of the patients who are there on the day of the visit. Information on the residence of the patients will show how far they travel to get to the hospital and will help in defining realistic service areas. Knowledge about the type of room which the patient is using will show whether empty beds are in one-bed, two-bed, or larger rooms. Information will also be gathered on age, sex, admission diagnosis of the patient, and on whether he has Blue Cross or other hospital insurance. Since the study is especially concerned with chronic or long-term illness, the interviewer will ask about the surgical, laboratory, or other procedures used for patients who have been in the hospital 30 days or more. In addition, data will be recorded on the size and type of hospital and the services available there.

Each licensed nursing home will also be visited by an interviewer, who will ask about the patient's usual activities (whether he is bedfast, can walk, can leave the grounds by himself, etc.). The interviewer will

record the date when a physician was last seen, and whether each patient has a private physician. He will also ask how many welfare patients are in the home, the type of staff and services provided by the home, and its monthly charge.

These interviews with hospitals and nursing homes will be carried out for a 10-month period beginning in August.

A second step in the study is a household survey which will begin in September. In this, interviewers will visit a sample of 4,000 households in rural and urban areas in Kansas and Missouri. These interviewers will ask how many of the people in the household have chronic conditions, what kind of conditions, how long they have had them, and how much disability has been caused. They will also ask how many of these people have been hospitalized during the past 12 months and whether they had hospital insurance.

The household interviews are expected to take four or five months. Through these surveys of people in institutions and at home, they hope to find, for example, how many chronic and aged sick need nursing care.

A third step in the study will be carried out in Kansas City, Missouri. In this, interviewers will visit a sample of about 300 people found in the survey to have chronic disease for a 12-month period beginning in September to see what services they use during this period.

These three steps in the study will be completed in the first year. During the second year the data gathered will be analyzed and reports will be issued. While this work is going on, the medical director of the study will explore with a few hospitals, chronic disease units, and nursing homes which volunteer to cooperate whether there are practical and effective methods to move the chronic or aged sick from the general hospital into a related facility which costs less and back into the hospital when they need that care.—*Community Studies, Inc., 417 East 13th Street, Kansas City, Missouri.*

Journal Style

The style of the JOURNAL is seldom a matter of comment. This fact is viewed by members of the Editorial Board with mixed feelings. If silence is prompted by the fact that questions of style seldom occur to readers of the JOURNAL, those of us who are concerned with the publication are perhaps doing a more effective work than we had thought.

What is style? One author says, "Style in writing is much the same thing as good manners in other human intercourse." Good manners smooth the course of events, are never obtrusive. Good style on

the printed page makes for ease in reading and clarity in understanding. The editor's work is successful if the reader is never distracted from the content of printed material by the way in which it is presented.

The JOURNAL's style is constantly undergoing evolution. Policies have been established from time to time to govern editorial procedure. In some instances these policies have become known only to those who are regular contributors. Other decisions on style, those that were thought to be of general interest, have been reported in these pages. Such a decision was made by the Editorial Board at a recent meeting.

Under consideration was the use of reference (superior) numbers in a scientific text to direct the reader to corresponding numbers in the bibliography. In the past, possibly through following the line of least resistance, the editor has followed the author's copy. This would be impractical in a paper now being reviewed by the Board since the author uses multiple superior numbers to support most of the statements he makes. The numbers are unnecessary when the author quotes opinions on which there is general agreement, and they are unsightly in the printed form when they extend across the width of a column.

The newly established policy provides that reference numbers will now be included only when the author refers to a specific author or to a definite article or book. This action by the Editorial Board was not taken arbitrarily or whimsically. It was accepted as the most logical rule on which to base procedure, after several other proposals had been studied and tried on an experimental basis. It will eliminate excessive use of superior numbers, which many readers find distracting, and at the same time will retain for authors the opportunity of listing sources for statements they wish to credit to others.

The new policy will have no effect on bibliographies. Each author should continue to list in a bibliography all the literature to which he has turned for information or opinion. If he wishes to show the source of a statement, for example in reporting controversial ideas or those on which a definitive stand has not been taken, he should use the name of the original author and follow that name with a superior number.

Members of the Kansas Medical Society who are now writing scientific papers or who will do so in the future are not expected to conform to this rule and other details of JOURNAL style in the preparation of manuscripts. The editor will keep his blue pencil sharpened. This publicity is intended only as an explanation to authors who may wonder why changes are made in the copy they submit. It's all

part of the plan to give members of the Kansas Medical Society the best JOURNAL we are capable of publishing.

Refresher Courses Tax Deductible

Physicians throughout the state will be pleased to know that expenses for attending refresher courses are now tax deductible. Provision for this deduction was outlined in a regulation made effective by the United States Internal Revenue Service on August 9, 1956.

The regulation is applicable to courses that will assist the physician in maintaining skills directly and immediately required in his work. This would include courses designed to keep practitioners abreast of current developments in the profession. To qualify, the study should be of short duration, should not be taken on a continuing basis, and should not carry academic credit.

Education designed to prepare the physician to enter a specialty does not come under the scope of the regulation. The Internal Revenue Service views such education as a means of increasing the earning power of the physician.

Similar interpretations apply to those in other professions. The teacher who must attend summer school to maintain her teaching certificate may deduct educational expenses; the instructor whose qualifications are sufficient for continued employment as a teacher cannot deduct expenses for courses taken for advanced degrees and a potential increase in earning power.

The deductions now allowed will not give major tax relief to any physician, but they will be of some benefit to a large number of Kansas doctors. During the period from July 1, 1955, to January 1, 1956, 1,059 physicians were enrolled for courses of the refresher type at the University of Kansas Medical Center.

Under the current regulation it will be worth while for the physician to make note of expenses incurred in connection with such education. In addition to tuition for the course, he may deduct amounts spent for travel, meals, and lodging while away from home. He may not deduct expenses incident to sight-seeing, entertaining, or other recreation incidental to the course.

For a long period of time the Law Department of the American Medical Association has been urging the issuance of such a regulation. It is to the credit of that department that confusion on interpretation of the law has been eliminated and a small measure of relief has been obtained.

Tumor Conference

Edited by FRANK Q. WINGFIELD, M.D.

Dr. Robinson: The cases to be discussed today represent two different types of vascular tumors of the neck. The first is not only an uncommon tumor but it behaved in an unusual manner. The second is a more common tumor but presents some difficult problems in therapy.

Dr. Cashion: The first patient (B.B.) is a 66-year-old colored woman who, ever since she fell from a chair a year before admission, suffered from intermittent pain in the nape of her neck. The pain was aggravated by motion but did not radiate. For two months prior to admission, the pain in her neck occurred less frequently and was less severe, but she noticed a change in her voice. For a year prior to admission, the patient had been treated by her local doctor for diabetes by control of her diet, and she had lost about 30 pounds. She also had exertional and paroxysmal nocturnal dyspnea during this period and has been taking medicine for these symptoms. She has had episodes of nausea and vomiting which she associates with this medicine. She also complained of constipation which required laxatives every four or five days. During this time she occasionally had black stools but no bright red rectal bleeding.

Physical examination at the time of admission revealed a fine tremor of the hands relieved by intention. There was marked restriction in movement of the neck with only slight movement backward and laterally and none forward. A neurological examination revealed 9th, 10th, 11th, and 12th cranial nerve palsy on the right and a questionable right Horner's syndrome. Because of these findings, it was felt that the patient had a metastatic lesion at the base of the skull on the right near the jugular and hypoglossal foramina. Because of the gastrointestinal symptoms, it was felt that this most likely represented a metastatic carcinoma from the gastrointestinal tract. Spinal puncture revealed protein of 99 mgm. per cent, and this suggested that the lesion was probably intracranial. Dr. Todd will demonstrate the x-ray findings.

Dr. Todd: X-rays of the upper intestinal tract following a barium meal revealed delayed emptying of the stomach but no organic lesion. These changes were considered to be on a functional basis. An x-ray of the chest, routine x-rays of the skull, and x-rays

of the mastoid cells revealed no abnormality. An intravenous pyelogram revealed normal kidneys. A barium enema was normal. An x-ray of the base of the skull showed an erosion of the occipital bone on the right at the margin of the foramen magnum. A cervical myelogram outlined a structure 1½ cm. in diameter on the right side at the foramen magnum (Figure 1).

Dr. Robinson: How were these myelograms done?

Dr. Williamson: Some neurosurgeons inject dye into the cisterna magna. Others, particularly South Americans, inject dye into the ventricles to outline brain tumors. In this case, the dye was injected into the subarachnoidal space from below and allowed to run intracranially. The x-rays made it clear that there was a destructive lesion in the region of the jugular foramen at the base of the skull and that it probably extended both intracranially and extracranially. We agreed that this was probably metastatic carcinoma, and we could not conceive of any primary lesion that arose in this location.

Dr. Robinson: How did you proceed in the treatment of this patient?

Dr. Williamson: Because we were unable to demonstrate a primary site for a metastatic carcinoma and because we thought we might be able to relieve the symptoms by local excision of the tumor, a crani-



Figure 1. Cervical myelogram outlining lower margin of the 1.5 cm. lesion at foramen magnum.

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Wingfield is a Trainee of the National Cancer Institute.

otomy was done. We encountered a dense extradural tumor that was not adherent to the dura. It was purple and vascular. We took one small biopsy, and the tumor bled so extensively that it was necessary to give the patient 1000 ml. of blood. The tumor bled like an arterial lesion. It could not be controlled by ordinary packing, and a large piece of muscle had to be sewed against the tumor to control the bleeding.

Dr. Robinson: Dr. Helwig, would you tell us about the surgical specimen?

Dr. Helwig: The tumor is composed of a diffuse growth of small, deeply basophilic cells arranged chiefly in the form of sheets of cells with spindle-form nuclei and little surrounding cytoplasm. There is a meshwork of vascular channels running throughout the lesion, and some of the vascularity appears to be neoplastic. In an occasional area there are cells which are a little plumper and appear to be filling up the vascular channels. I am unable to distinguish between an epithelial metastasis or a vascular angioendothelioma. A vascular angioendothelioma could occur in this area, but it would be rare. If this is a metastatic lesion from a tumor below the diaphragm, the tumor cells would have had to travel up the vertebral venous system or go through the lungs. The capillaries of the lung are among the largest capillaries in the body, and small tumor emboli or single malignant cells may go through the lung in this manner.

Dr. Mantz: In my opinion, the lesion bears some resemblance to a glomus tumor. These usually present in the ear, however, and this lesion does not. Therefore, I thought that this was probably an angioendothelioma but that an angioblastic type of meningioma must be considered.

Dr. Boley: I also thought that this lesion resembled a glomus jugulare tumor, and silver stains presented a picture highly suggestive of this diagnosis.

Dr. Robinson: Will you explain to us just what a glomus jugulare tumor is?

Dr. Boley: These tumors arise from the glomus jugulare body which may be in the jugular foramen, the jugular canal, or near the upper part of the ear. They are identical in gross and microscopic appearance to the carotid and aortic bodies which have been shown to be chemoreceptors.¹ Most glomus jugulare tumors present as tumors in the middle ear. They are usually benign but occasionally metastasize.²

Dr. Robinson: What treatment is planned for this patient?

Dr. Williamson: The glomus jugulare body lies around the jugular vein in the jugular foramen. It is a vascular body. According to the pathologist, the histologic picture is not incompatible with the diagnosis of glomus jugulare tumor, and we feel that this

is the correct diagnosis. Other clinics have reported similar cases of glomus jugulare tumors presenting in the jugular foramen and involving the 9th, 10th, 11th, and 12th cranial nerves.^{2, 3, 4}

This patient is 60 years old and has a slowly growing tumor. She is not seriously ill despite the palsy of the 9th, 10th, 11th, and 12th cranial nerves on the right. Pain is no real problem, and she has no increased intracranial pressure. In view of the extreme vascularity of this lesion and the involvement of the important structures in this area, we feel that surgical removal should not be attempted and that the lesion should be treated with x-ray. I am sure she would be in serious trouble if we attempted radical removal.

Dr. Helwig: In our experience, these lesions are not responsive to radiation, but unless the patient is pretty young you should not try to remove them surgically. When we treat our carotid body tumors, we don't even biopsy them but just treat them with x-radiation and hope that it does some good.

Dr. Robinson: There seems to be unanimous agreement that this patient should be treated by x-ray and not surgery. Even if she is not benefited by x-ray therapy, this tumor is slow growing and her condition should remain essentially stationary for a long period.

Dr. Robinson: The second case concerns a more common vascular tumor of the neck that is usually treated by surgery.

Dr. Mosely: The second patient (L.L.) is an 8-month-old white girl who was well until one day prior to admission. At that time a swelling was noted in the left side of her neck. The swelling enlarged over a period of a few hours and became blue. The patient was seen by the local medical doctor and then hospitalized. At the time of admission to the hospital, there was a mass in the left side of the neck measuring 3 x 5 cm. There was venous distension around the mass and in the anterior chest wall. The mass was cystic, non-tender, and did not feel fluctuant. It was not attached to the skin but appeared to be fixed to the deep tissues of the neck.

Dr. Robinson: Were x-rays helpful?

Dr. Todd: X-rays of the chest and neck showed, distinct from the thymic and cardiac shadows, a large, soft tissue shadow 5 cm. in diameter lying in the upper mediastinum on the left (Figure 2). The trachea was deviated laterally to the right and somewhat anteriorly. A lateral projection demonstrated that this mass was lying posteriorly in the upper mediastinum against the spine. This mass was continuous with the mass in the neck which lay above the clavicle on the left side.

Dr. Hardin: Clinically, we felt confident that this was a cystic hygroma. The pediatricians wanted to defer the operation because of the child's size. However, I felt that it would be better to proceed at this

time because this is an invasive lesion that can cause compression symptoms. If the lesion becomes infected, mortality may be high. These lesions communicate with the venous system and should not be aspirated preoperatively.

When these tumors are limited to the neck, they do not present too difficult a surgical problem. When they extend into the chest, however, the problem becomes much more difficult. Because of the intimate association with the important structures of the neck, an approach to this tumor from the neck, going blindly into the chest, would be dangerous. It was therefore thought better to approach this lesion through the chest first and to remove as much as possible of the lesion from that approach. Because of the age of the child, the remainder of the lesion was removed in a second stage at a later date.

At operation, the hygroma was found to involve the upper medial aspect of the chest and mediastinum. The left subclavian artery and vein, the left carotid artery, the vagus nerve, the phrenic nerve, and the anterior thoracic duct were involved by this tumor. By careful dissection, all of these structures were preserved. A small tongue of tissue was seen to extend to the opposite side of the chest. In order not to subject this infant to a bilateral thoracotomy, a catheter was sewed into the remaining finger-like projection and later irrigated and sclerosed with 50 per cent glucose.

In the second operation, the mass in the neck was seen to surround the brachial plexus, subclavian vein, common carotid artery, vagus nerve, phrenic nerve, and superior vena cava. The lesion was dissected away from these structures except for the retrosternoclavic-

ular portion which was irrigated and sclerosed with 50 per cent glucose. The patient tolerated both of these procedures well.

Dr. Helwig: The tumor, in this case, occurred in a common site. They usually begin in the neck and extend into the mediastinum. Occasionally, however, they may begin in the mediastinum and secondarily extend into the neck. These lesions are true neoplasms and they send out buds of channels which may penetrate into surrounding tissues. This tumor was made up of a mass of varying sized cystic nodules which were lined by flattened endothelial cells. There are also lymphocytes in the wall of these cysts, and in some areas the lymphocytes are numerous. These lesions may appear elsewhere in the body and may be extensive. I have recently studied a case which involved the entire side of a little child extending from the hip to the axilla. These lesions do not respond well to radiation therapy.

Dr. Robinson: Do you think that these are related to lymphangiomas?

Dr. Helwig: I think all hygromas are lymphangiomas. These are true neoplasms and are different from the congenital lymphangiectasis one sees in the extremities. If any cystic hygroma is sectioned extensively enough, lymphoid tissue is found somewhere.

Dr. Mantz: I have always considered them as lymphangiomas. Perhaps some of them represent neoplastic transformations of small angioblastic remnants which were never adequately hooked up in the development of the cardiovascular system. The isolated remnant may undergo neoplastic proliferation and may later establish communication with either the lymphatics or the vascular tree. If the spaces do not contain blood, it is difficult for me to distinguish between a lymphangioma and a hemangioma.

Dr. Robinson: I think that the main problem in these cases is in the surgical approach. Nothing else apparently will control these tumors. If you leave a little of the tumor behind, it will continue to grow. If the child has an upper respiratory infection, the tumor tends to swell and may encroach upon the airways, necessitating a tracheotomy as a preliminary step before the operation. If portions of the tumor are left behind, serious infection may occur. Some of these tumors, in my experience, have been simple to dissect. They just roll away from the other tissues. In other cases, however, they infiltrate diffusely. These are difficult to remove entirely, and it is also difficult to try to remove the remaining tumor at a second operation because of the fibrosis which has occurred. I feel that the surgical approach in this case was correct. A follow-up on this patient, four months after discharge from the hospital, revealed no evidence of recurrent hygroma.

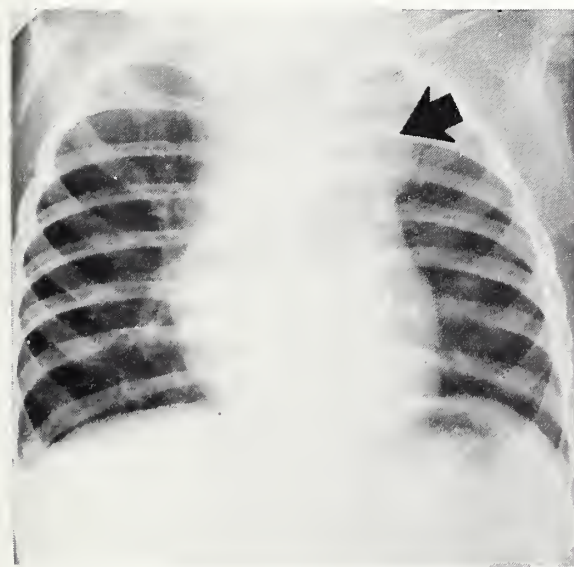


Figure 2. Soft tissue mass in superior, posterior left mediastinum.

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Ford Foundation Grants

Checks totalling \$26,080,200 were mailed recently by the Ford Foundation to 959 voluntary, nonprofit hospitals in the United States and its territories. This was in addition to two previous mailings, in April and May, to some 2,000 hospitals.

The current checks represent one-half the amount of the individual grants. The remaining half will be paid in March of 1957. Amounts were determined on the basis of patient days of service and the number of births.

Each institution will determine for itself how the funds can best be used to improve and expand services to the community.

The following Kansas institutions received checks most recently: Ellsworth County Veterans Memorial Hospital, Ellsworth, \$12,650; Boothroy Memorial Hospital, Goodland, \$5,650; Kiowa County Memorial Hospital, Greensburg, \$5,000; Halstead Hospital, Halstead, \$41,150; Hoisington Lutheran Hospital, Hoisington, \$6,700; Cushing Memorial Hospital, Leavenworth, \$15,700; Lincoln County Hospital, Lincoln, \$5,000; Lindsborg Community Hospital, Lindsborg, \$5,150; Lyons Hospital, Lyons, \$5,000; Mercy Hospital, Moundridge, \$5,000; Prairie View Hospital, Newton, \$7,950; Phillips County Community Hospital, Phillipsburg, \$5,000; Scott County Hospital, Scott City, \$5,600; Seneca Hospital, Seneca, \$5,950; Jane C. Stormont Hospital and Training School for Nurses, Topeka, \$57,450; St. Francis Hospital and School of Nursing, Wichita, \$125,000; Salvation Army Women's Home and Hospital, Wichita, \$7,050; St. Joseph's Hospital, Wichita, \$56,900.

National Awards for Auxiliary

The Woman's Auxiliary to the Kansas Medical Society and two of its component groups won awards in the national Auxiliary's contest for securing subscriptions to *Today's Health*. The state group won \$40, and the county awards were \$25 and \$15.

The Kansas Auxiliary ranked first in Group III, made up of organizations having from 1,001 to 2,000 members. Mrs. Chester L. Young, Kansas City, was chairman of the *Today's Health* committee for the state.

The Woman's Auxiliary to the Sedgwick County Medical Society, working under Mrs. F. Carter Newsum, Wichita, placed second in competition among groups having 100 or more members. Among counties having no more than 18 members, the Kansas Greenwood-Woodson Auxiliary placed third. Mrs. Harry West, Yates Center, was chairman of sales there.

Fellowships in College of Chest Physicians

Six Kansans became fellows of the American College of Chest Physicians at a meeting held in Chicago in June: Dr. Ben H. Buck, Jr., Dr. John W. Fulton, and Dr. Robert K. Purves of Wichita and Dr. Hughes W. Day, Dr. Michael L. Furcolow, and Dr. Ann Pollak of Kansas City. Dr. Charles Pokorny, Halstead, was elected governor of the college for Kansas.

Jordan Memorial Fund

Friends of Dr. Ralph E. Jordan, Emporia, who died of bulbar poliomyelitis on July 11, have initiated a memorial fund to be used for the education of his six children. Anyone wishing to contribute may send a check to Mr. Ivan Anderson, Administrator, Newman Hospital, Emporia.

Grant for Television at K.U.

A grant of \$100,000 to the University of Kansas Medical Center for expansion of its television teaching program was announced last month by the W. D. Kellogg Foundation, Battle Creek, Michigan. The school will receive \$20,000 a year for each of five years. Dr. David Ruhe, chief of audiovisual education, will direct the television work.

Correction

An error appeared in a table which accompanied a paper on "Burns," published in the June issue of the *JOURNAL*. The table listing minimal food needed by patients with third degree burns showed the requirements for riboflavin and nicotinamide in grams, and the measurement should have been in milligrams.

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

If medical research doesn't move ahead in the current fiscal year (ending June 30, 1957), it won't be the fault of Congress. The seven research organizations that make up the National Institutes of Health have far more money than they have ever had, and probably much more than their directors even dared hope for last winter at the start of hearings on their budgets. Every one of the research institutes received a substantial increase over last year, and the funds of five of them were almost doubled.

The Institutes have a total of \$170.4 million to spend before next July 1. This is about 80 per cent more than they had last year. In discussing the appropriations bill on the Senate floor, Senator Lister Hill (D., Ala.) said the bulk of the money will go for grants to non-federal institutions—hospitals, medical schools, clinics, and state and local organizations engaged in research.

A breakdown by disease categories shows the following picture:

For cancer research, \$48.4 million, in contrast to \$24.8 million for the previous year. This year's total is \$16 million more than the administration asked when budget requests were sent to Congress in January.

For mental health work, \$35.1 million, in contrast to last year's \$18 million. This is \$13.4 million more than had been requested originally.

For heart disease research, \$33.3 million, compared with \$18.7 million last year and \$22.1 million originally requested.

For work on arthritis and metabolic diseases, \$15.8 million, or \$5.1 million more than last year and \$2.5 million more than Congress was asked for.

For research in neurology and blindness, \$18.6 million, compared with \$9.8 million last year and \$12.1 million originally requested.

For work on allergies and infectious diseases, \$13.2 million, compared with \$7.5 million last year and \$9.7 requested.

For dental research, \$6 million. While this is small compared with money voted for other U. S. research institutes, it is almost triple the \$2.1 million spent last year. The huge increase is the result of a sus-

tained campaign by the American Dental Association.

Senator Hill and Rep. John E. Fogarty (D., R. I.) led the fight in Congress for the record-breaking research appropriations. Under the latter's chairmanship, a House appropriations subcommittee boosted the total for the seven institutes to about \$124 million, a figure that was accepted both by the full Appropriations Committee and the House.

In addition to heading the Senate appropriations subcommittee that handled this funds bill, Senator Hill also is chairman of the Labor and Welfare Committee and extremely active in health legislation. His subcommittee pulled up the totals to the \$170 million. After the Senate-House conference committee disagreed on the spending, Rep. Fogarty carried the fight to the floor, where he persuaded the House to accept all of the higher Senate figures.

Other federal health programs, mainly concerned with disease control and hospital construction, also fared well with the Congress. The Hill-Burton program, for construction grants to hospitals, has \$125 million for the current year, or \$14 million more than last year. For vocational rehabilitation grants, the figure is \$41.5 million, a \$2.7 million increase; for general public health assistance to states, it is \$18.16 million, a \$600,000 increase; for Indian health work, it is \$38 million, a \$3.3 million increase.

With Salk vaccine being released in ever expanding volume, the Public Health Service is urging states and communities to increase the priority age to 20 and to use up supplies as fast as received. Said Secretary Folsom: "I urge parents, physicians, and health officials to cooperate in making the maximum use of the increasing supply as soon as it becomes available. . . ."

Civil Aeronautics Administration, believing the time has come to review procedures in pilot medical examinations, has hired a private organization to conduct a thorough investigation and make recommendations. Two questions: Should lower standards be allowed for older, experienced pilots? Should crew members and ground crewmen, as well as pilots, be examined periodically?

Less than three months after his third appointment to a four-year term as Surgeon General of U. S. Public Health Service, Dr. Leonard Scheele resigned to take a post in the pharmaceutical industry so he could "provide more properly" for his family.

Although no new legislation was enacted in that field, witnesses at a long series of hearings on civil defense were pretty much in agreement that the job can't be done properly unless more authority is voted to the Federal Civil Defense Organization.

PHYSICIANS' ACTIVITIES

Dr. E. J. Grosdidier, Kansas City, was recently named to the Kansas City-Wyandotte County Board of Health.

A citation of merit for outstanding achievements has been awarded **Dr. Galen Tice**, Kansas City, by McPherson College. He received his bachelor's degree from the college in 1922.

The Lawrence Medical Arts Clinic announces that **Dr. James C. Dowell** and **Dr. Phillip Godwin** are new members of its staff. Dr. Dowell, a graduate of Illinois University Medical School, recently completed a three-year residency in internal medicine at the University of Kansas Medical Center.

Dr. Robert O. Bill, Topeka, is moving to Indianapolis to head the out-patient clinic at Norway Hospital. In Topeka he had been director of the Shawnee County Guidance Center, a position now held by **Dr. Robert B. Forman**.

Dr. Marion C. Pearson, Concordia, recently became a diplomate of the American Board of Surgery.

Dr. Roy R. Shoaf, who has been practicing in Lawrence, has begun a residency in obstetrics at the University of Illinois Hospital, Chicago.

Dr. J. M. Stout, a 1955 graduate of the University of Kansas School of Medicine, is now practicing in Hutchinson in association with **Dr. Marion E. Nunemaker** and **Dr. John Blank**. The thesis Dr. Stout wrote during his senior year at the medical school is being published in this issue of the JOURNAL.

A feature story about **Dr. W. Clarke Wescoe**, dean of the University of Kansas School of Medicine, was published in the *Kansas City Star* on July 1.

Dr. Charles B. Powell, who has been practicing in Columbus, has gone to New Orleans for a residency in orthopedic surgery at Charity Hospital.

Dr. Thomas F. Taylor, who was on the staff of the state sanatorium at Norton before taking a residency in internal medicine at the VA Hospital in Denver, is now practicing in Phillipsburg in association with **Dr. Mary Glassen**.

Dr. William A. Smiley, Jr., formerly of Junction City, has joined the surgical staff of the state sanatorium at Norton.

The Kansas branch of the National Flying Physicians Association recently elected **Dr. Lyle G. Glenn**, Protection, as its president and **Dr. Charles F. Taylor**, Norton, as secretary.

Dr. Fred E. Brown, who was graduated from the University of Kansas School of Medicine in 1955 and recently completed internship at St. Luke's Hospital, Kansas City, Missouri, has opened an office in St. Marys.

"Heart Disease" was the subject of a talk given by **Dr. G. W. Hammel**, El Dorado, before the Eureka Kiwanis Club recently.

Dr. Richard B. Williams, who has been practicing in Independence for 18 months, went to Kansas City on July 1 to begin a residency in radiology.

A Kansan, **Dr. William J. Reals**, Wichita, was one of the scientific exhibitors at the recent meeting of the American Medical Association in Chicago. In cooperation with Col. Frank M. Townsend, Armed Forces Institute of Pathology, Washington, he presented an exhibit on thyroid gland studies.

July 1 was retirement day for **Dr. C. C. Nesselrode**, Kansas City, who had been in practice for 50 years. A feature story about him was published in the *Kansas City Kansan* on June 8.

The Kansas Psychiatric Society announces that **Dr. Thomas L. Foster**, Halstead, is now serving as its president. **Dr. Austin J. Adams**, Wichita, is president-elect of the group.

A Fulbright research award has been granted to **Dr. Ralph I. Canuteson**, director of student health services at the University of Kansas, Lawrence. He will do his research work, in the field of college health, at the University of Oslo, Norway.

Dr. Jack R. Cooper, Kansas City, spoke before the Wyandotte and Johnson County Association for Retarded Children at a recent meeting. His subject was "Causes and Probabilities of Cure."

Dr. J. V. Van Cleve, Wichita, was a guest lecturer at a refresher course sponsored by the University of Colorado School of Medicine last month. His subject was "Relation between Internal and Cutaneous Diseases."

The Buick-Oldsmobile-Pontiac Assembly Division, Kansas City, announces the appointment of **Dr. Harold Allen** as associate medical director of the plant. Dr. Allen, a graduate of Jefferson Medical College, Philadelphia, joined the General Motors staff in 1955 as a trainee in industrial medicine.

A former resident of Hutchinson, **Dr. David Lukens**, recently returned to practice internal medicine there. He was graduated from Johns Hopkins University Medical School in 1948, served with the Army in Korea, and then completed a residency at Johns Hopkins Hospital. He is a diplomate of the American Board of Internal Medicine.

Dr. Frances A. Allen, who recently completed a three-year residency in internal medicine at the University of Kansas Medical Center, has returned to practice in Newton. She recently presented a paper, "The Study of Red Cell Survival Time in Patients with Cirrhosis of the Liver," before the National Society of Nuclear Medicine in Salt Lake City.

DEATH NOTICES

MERVIN TUBAN SUDLER, M.D.

Dr. M. T. Sudler, 80, dean of the University of Kansas School of Medicine from 1911 to 1924, died at his home in Lawrence on June 22. He was an honorary member of the Douglas County Medical Society. A graduate of the College of Physicians and Surgeons, Baltimore, in 1901, Dr. Sudler served as an instructor in anatomy at Johns Hopkins and at Cornell before coming to Kansas in 1905. His primary interest here was in surgery, and he was a fellow of the American College of Surgeons.

WILLIAM FREDERICK SCHOOR, M.D.

Dr. W. F. Schoor, 79, who had practiced in Hutchinson more than 50 years, died at Grace Hospital there on June 22 after an illness of two years. He began practice there after his graduation from University Medical College of Kansas City in 1904 and was active until he became ill. He had served both as city physician and as coroner of Reno County. Dr. Schoor was an honorary member of the Reno County Medical Society.

RALPH BOWMAN EARP, M.D.

A physician who had practiced for 59 years, Dr. R. B. Earp, 81, died on June 25, after a two-year illness. He was graduated from Central College of Physicians and Surgeons, Indianapolis, in 1897 and practiced first in Mooreland and Dunkirk, Indiana, moving to El Dorado in 1908. He had been an honorary member of the Butler County Medical Society for three years.

ALFRED O'DONNELL, M.D.

A physician who served as president of the Kansas Medical Society, 1924-1925, Dr. Alfred O'Donnell, Ellsworth, died on June 26 at the age of 83. Born in Ireland, Dr. O'Donnell came to this country in his youth. He was grad-

uated from University Medical College, Kansas City, in 1900 and took postgraduate work at New York University and at the Mayo Clinic. He specialized in surgery and was a diplomate of the American Board of Surgery and a fellow of the American College of Surgeons.

Dr. O'Donnell was interested in many civic enterprises. For 25 years he was on the school board at Ellsworth, he was a charter member of the Ellsworth Lions Club, and he served many terms on the board of Kansas Wesleyan University, Salina.

An honorary member of the Central Kansas Medical Society, he had been in retirement for 10 years prior to his death.

RALPH ENSIGN JORDAN, M.D.

Bulbar poliomyelitis was the cause of death for Dr. Ralph Jordan, 39, who died at Emporia on July 11 after three days of illness. He had been in practice in Emporia for a year, having previously been located at Osborne and Holton. He was graduated from the University of Kansas School of Medicine in 1940 and served his internship at Trinity Lutheran Hospital, Kansas City, Missouri. During World War II he served as flight surgeon in the European theater, holding the rank of major. He was an active member of the Lyon County Medical Society.

ROBERT A. J. SHELLEY, M.D.

Dr. R. A. J. Shelley, 81, an honorary member of the Comanche-Clark-Kiowa Medical Society, died at Coldwater on July 3 after an illness of six weeks. He had practiced in the Coldwater community since 1909, having graduated from the University of Tennessee College of Medicine in 1903. His first office was at Gap Creek, Kentucky, and from there he moved to Waldron. He served as county health officer for several years and had also been mayor of the city of Coldwater.

Dr. M. F. Stock has announced the closing of his office in Weir to carry on all of his practice in Pittsburg.

Dr. Varden J. Loganbill, a 1954 graduate of the University of Kansas School of Medicine who has been practicing in Wichita, has announced the opening of an office in McPherson.

A position as medical director of the Midwest Medical Research Foundation, Wichita, has been accepted by **Dr. Byron T. Eberle**, who formerly practiced in Derby.

Dr. P. L. Beiderwell, Belleville, announces that **Dr. Richard Field** is now associated with him in practice. Dr. Field, who was graduated from the University of Kansas School of Medicine, recently completed internship at Good Samaritan Hospital, Phoenix.

Dr. F. W. Anderson, who has practiced in Anthony since 1947, has closed his office to move to Circleville, Ohio. He will practice there in association with a former classmate.

Cost of Health Services

The average individual in the United States spends \$65 and the average family \$207 for personal health services each year, according to Dr. Odin W. Anderson, research director of the Health Information Foundation. His survey was based on interviews in the homes of a scientifically selected sample of American families.

"The provision of personal health services is one of the largest enterprises in the United States," he said, "totalling annually over \$10 billion for private care." He estimated that \$3.8 billion is paid to physicians, \$2 billion to hospitals, and \$1.6 billion to dentists.

Dr. Anderson believes that approximately eight per cent of the families incurred no charge for any personal health services during a year, while more than 10 per cent incurred charges of \$500 or more.

The annual hospital admission rate per 100 persons, he observed, was nine for men and 15 for women, although he believes the number of days of hospital care per 100 persons in a year is a better measure of hospital utilization. That figure was 90 days per 100 persons, 70 for men and 100 for women. The figures rose sharply to 150 days for persons over 55 years of age.

"For the population as a whole," he said, "the

number of surgical procedures per 100 persons was 7.6 for males and 8 for females."

The rate of surgical procedures was nine per 100 persons covered by health insurance and five for uninsured persons. The average family with insurance incurred annual bills of \$237 for all personal health services, and the average family without insurance incurred charges of \$154.

Memorial for Dr. Sudler

Friends of the late Dr. Mervin T. Sudler, former dean of the University of Kansas School of Medicine, who died on June 23, have announced plans for a memorial. Those wishing to contribute to the fund may do so by sending checks to the American Medical Education Foundation, 535 North Dearborn Street, Chicago 10, Illinois. An attached letter should stipulate that the contribution is for the Sudler Memorial Fund and for the University of Kansas School of Medicine.

Vaccine for Respiratory Disease

A new vaccine which has been found to reduce the incidence of hospitalized cases of respiratory disease by more than 80 per cent has been described by the Department of the Army. The vaccine, developed and prepared at the Walter Reed Army Institute of Research, Washington, was evaluated in soldiers at Fort Dix, New Jersey. It was prepared from tissue cultures of monkey kidney which had been infected with the two predominant RI viruses. The virus in the vaccine was killed with formaldehyde.

Golden Belt Society Meets

A meeting of the Golden Belt Medical Society was held at the Country Club in Manhattan on July 12 with members of the Riley County Medical Society as hosts. Dr. Henry Laurens, Jr., Salina, and Dr. C. Frederick Kittle, University of Kansas Medical Center, discussed "Medical and Surgical Treatment of Peptic Ulcer." Dr. Ralph C. Moore, Omaha, spoke on "Medical Aspects of Highway Accidents."

A grant of \$14,850 was awarded recently to the University of Kansas School of Medicine by the Life Insurance Medical Research Fund. The appropriation will be used at the McIlvane Laboratory for studying the action of digitoxin. Dr. Santiago Grisolia, director of the laboratory, will be in charge of a group of six who will do the research.

Ectopic Pregnancy

Review of the Literature and Report of 80 Cases

JAMES MURRAY STOUT, M.D., *Kansas City*

The term ectopic is derived from the Greek word *ectopos* meaning displaced. Ectopic pregnancy, therefore, is a displaced pregnancy, or, as the term is now employed, gestation anywhere outside the uterine cavity. The various types of ectopic pregnancy generally considered are tubal, interstitial portion of the tube, uterine cornu, abdominal, ovarian, cervical, and the rudimentary horn of the uterus. The tubal variety comprises an overwhelming majority of the cases, Eastman¹¹ stating that more than 95 per cent of ectopic pregnancies are of tubal origin. This paper will concern itself mainly with a review of tubal pregnancy and an analysis of 80 consecutive cases of ectopic gestation at the Kansas University Medical Center from 1948 through 1954.

HISTORY

Most of the information which is to follow was obtained from Schumann's³⁵ historical account of ectopic pregnancy. According to him the condition was unknown to the Greeks and Romans. The first physician to describe it was Abu'l-Qāsim, known in Latin Europe as Albucasis, the greatest surgeon of Islam, who was born of Spanish parents at El Zahra, near Cordoba, in 936 A.D. Albucasis reported his case in the middle of the 11th century, after seeing parts of a fetal body escaping from the abdomen by suppuration. This was obviously a case of abdominal pregnancy.

Cordaeus then reported the famous lithopedion of Sens early in the 16th century. Cornax, in the early half of the 16th century, also reported an abdominal pregnancy in which an ulcerating lesion was noted on the abdominal wall. This lesion was supposedly incised and a fetus taken from the abdominal cavity.

The earliest definite surgical interference for removal of an abdominal fetus was by Primerose in 1594. Felix Platerus described another characteristic case in which a pregnant woman had been in labor eight days and did not deliver; a swelling later developed at the umbilicus which was laid open and an entire, but semiputrid, fetus was extracted.

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Stout has just completed his internship at the University of Kansas Medical Center, Kansas City, Kansas.

To Riolan, in 1604, goes the distinction of first recording a case of ruptured tubal gestation with the classical symptoms. The case was described as that of a 31-year-old woman who had a tumor above her right groin but who had no complaints until she was four months pregnant. At this time she developed violent pain which extended from the pelvis to the upper chest with occasional syncope, continuing until her death. Her right fallopian tube was found to contain a fetus.

Pierre Dionis is credited with having the first understanding as to the etiology of ectopic pregnancy. He speaks of an egg too large to pass through the fallopian tube and of a fallopian tube too small to permit passage of the egg.

Great advances in the treatment for ectopic pregnancy were initiated by Parry's work in 1876, when he suggested surgery as the possible treatment for ruptured tubal pregnancy. The honor of performing the first operation for this emergency went to Lawson Tait in 1883. Tait's first patient died, but he lost only one of his next 40 cases.

The first American to operate for ectopic pregnancy was John Bard, for an abdominal pregnancy, in 1759. For ruptured tubal pregnancy, C. K. Briddon was the first American to operate, in 1883. From this time on, with only a few brief interruptions, operative interference has been the recognized treatment of choice.

INCIDENCE

In 1923 Schumann³⁵ reported an incidence of one ectopic pregnancy in every 303 intra-uterine pregnancies. Since that time there have been many reports on the incidence of ectopic pregnancy. Word et al.⁴⁴ recently stated that occurrence has doubled during the past 15 years because of live births increasing approximately 65 per cent and because of the widespread use of sulfas and penicillin in the treatment of salpingitis. Krohn and Priver²² state that since the advent of penicillin, ectopic pregnancies in various areas have approximately doubled. They state that the incidence of ectopic pregnancy is almost four times that of ten years ago. Johnson and Post¹⁸ say the increase in incidence is due to sulfas and antibiotics and residents being "ectopic minded."

Incidence has recently been reported as follows: Campbell,⁶ one ectopic pregnancy in every 165.4

pregnancies; Carrabba and Silberblatt,⁷ one in 129; Cook and Butt,⁸ one in 95; Word,⁴⁵ one in 140.6 in whites and one in 95.8 in colored; Anderson,¹ one in 190 in white and one in 130 in colored.

As shown above, Word⁴⁵ and Anderson¹ reported a higher incidence in the colored race than in the white. Anderson¹ states that in Baltimore, in 1951, there was a 50 per cent higher incidence in Negroes than in whites. Priddle et al.³³ reported that 84.5 per cent of their cases were Negroes. At the Kansas Medical Center, 48 (60 per cent) patients were colored and 32 (40 per cent) were white. This higher incidence in the colored race is generally attributed to a higher incidence of pelvic inflammatory disease.

As to the most common age at which ectopic pregnancy is found Johnson¹⁷ reports an average age of 27 years. Crawford and Hutchinson⁹ report 29 years, and Priddle et al.³³ report 28.2 years as an average age. At Kansas University an average age of 28.38 years was found, with a range of 15 through 40 years. The majority of Kansas University's cases were in the third decade (Table I). Ware and Winston¹¹ report 80.8 per cent of their cases in the 20 through 35 age group. Carrabba and Silberblatt⁷ report 86.66 per cent of their 150 cases in the 20 through 35 age group. It is, of course, possible for ectopic pregnancy to occur any time during the childbearing age.

TABLE I
COMPARISON OF THE AGE DISTRIBUTION OF 80
CONSECUTIVE CASES AT KANSAS UNIVERSITY
MEDICAL CENTER

Age Group	No. of Patients	Per Cent
Second decade	5	6.25
Third decade	49	61.25
Fourth decade	26	32.50
Fifth decade	0	0.0

Many observers have noted that patients who have had sterility problems have a high incidence of ectopic pregnancies. Grant¹⁶ reported that the incidence of ectopic gestations in the sterility clinic was seven times the usual incidence. Bender³ states that in pregnant women who had previously been sterile, the ectopic rate was significantly increased. Grant¹⁶ says that the frequency of ectopic pregnancy in patients treated for tubal blockage by high pressure insufflation was 25 times that found among the rest of the pregnant members of the population. At Kansas University, three of the patients had been to the sterility clinic and two had had their tubes treated by high pressure insufflation. Smith,³⁷ Jones,¹⁹ Bookrajian and Luther⁴ report 27.8 per cent, 39.57 per

cent, and 21.5 per cent, respectively, of their ectopic pregnancies as being gravida 0. Tables II and III show the gravidity and parity of the women having ectopic pregnancies at Kansas University.

At Kansas University there was an average lapse of 2.62 years since the last pregnancy. In 20 (25 per cent) patients one year or less had elapsed since the last pregnancy. In 58 (72.5 per cent) patients there had been six years or less since the last pregnancy. The span was three months through 20 years.

TABLE II
PREVIOUS GRAVIDITY OF ECTOPIC PREGNANCIES
AT THE KANSAS UNIVERSITY MEDICAL SCHOOL

Gravidity	No. of Cases	Per Cent
0	11	13.75
1	18	22.50
2	17	21.25
3	17	21.25
Others	17	21.25

TABLE III
PREVIOUS PARITY OF ECTOPIC PREGNANCIES AT
THE KANSAS UNIVERSITY MEDICAL CENTER

Parity	No. of Cases	Per Cent
0	17	21.25
1	24	30.00
2	13	16.25
3	13	16.25
Others	13	16.25

ETIOLOGY

The etiology of ectopic pregnancy has been the cause of much investigation and speculation. Probably the most important etiologic factor is disturbed transportation of the ovum. Novak²⁹ considers chronic pelvic inflammatory disease the dominating factor in this disturbed transportation. He states that, as a result of this, there may be narrowing of the tubal lumen, or the tubal folds may become agglutinated to produce blind alleys. He also suggests that inflammation may impair muscular and ciliary activity of the tube and in this way disturb the normal progress of the ovum. Peritubal inflammation may form adhesions which may constrict or angulate the tube and thereby inhibit ovum transportation.

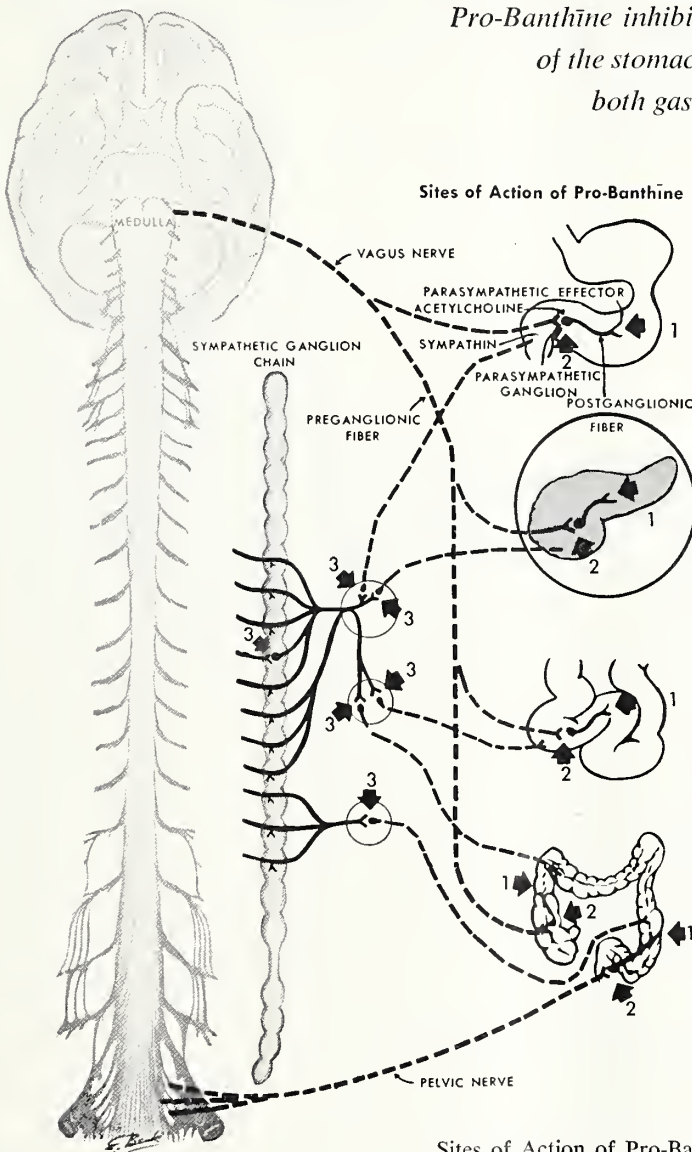
Litzenburg²⁶ does not think inflammatory disease is as important as do most observers. He states that less than ten per cent of his specimens, including tubes sent by others for pathological examination, showed positive evidence of salpingitis. Eastman¹¹ believes salpingitis is an important cause of tubal pregnancy but thinks only about a quarter of the cases

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1. Jones, C. A.: Arch. Int. Med. 96:332 (Sept.) 1955.
2. Zollinger, R. M.: Postgrad. Med. 15: 323 (April) 1954.
3. Woodward, E. R.: M. Clin. North America 38:115 (Jan.) 1954.
4. Schwartz, I. R., and Hinton, J. W.: Personal communication, February, 1955.

Sites of Action of Pro-Banthine. The principal site of action of Pro-Banthine is on the parasympathetic system where it exerts a dual action while exerting a single and lesser action on the sympathetic system: (1) parasympathetic effector; (2) parasympathetic ganglion; (3) sympathetic ganglion (see arrows).

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can be attributed to it. The following shows the frequency of salpingitis in ectopic pregnancy as reported by various investigators: 33.5 per cent,⁴⁵ 15 per cent,⁶ 8.3 per cent,¹⁹ 28 per cent,³³ 49.4 per cent,³⁷ 27.2 per cent,⁴ 29.67 per cent,⁹ and 18.6 per cent.⁷ At Kansas University, 25 of the specimens submitted for pathologic examination or 31.25 per cent, showed evidence of salpingitis.

Smith³⁷ suggests that appendicitis, tuberculosis, and previous laparotomies may be other sources of infection. Jones¹⁹ reported 47.9 per cent of his 48 cases had had previous surgery. Crawford and Hutchinson⁹ reported 15.3 per cent as having had previous lower abdominal surgery. At Kansas University 19 (23.75 per cent) cases had had previous surgery, 14 for appendicitis.

Because of the fairly large numbers of ectopic gestations in patients who had had appendectomies some observers speculate there will be a higher incidence of ectopic pregnancies in the right than in the left tube. Table IV shows the frequency of right and left tubal gestations as reported by many observers, including the author.

TABLE IV
FREQUENCY OF RIGHT AND LEFT TUBAL
PREGNANCIES AS REPORTED BY VARIOUS
INVESTIGATORS

Reporters	No. of Cases or Per Cent in Rt. Tube	No. of Cases or Per Cent in Left Tube	Bilateral
Kansas			
University	38 (48.1%) cases	41 (51.9%) cases	0
Word ⁴⁵	85	54	0
Campbell ⁶	211	156	0
Jones ¹⁹	32	16	0
Bookrajian et al. ⁴	62	63	0
Draa et al. ¹⁰	124	100	0
Crawford et al. ⁹	53.0%	46.0%	1%

Krohn and Priver^{21, 22} have reported antibiotics used in the treatment of pelvic inflammatory disease may prevent complete occlusion of the tube; in these damaged but patent tubes, tubal pregnancy would be more likely to occur.

Other factors which may disturb or delay transportation of the ovum are: congenital diverticula, tumors outside the tube such as myomas and ovarian cysts, intratubal polyps, adenomyosis, external transmigration, and factors inherent in the ovum. Osiakina-Rajdestvenskaia³¹ states that among mechanical factors which may disturb ovum transportation, "defective development of the tube of postembryonic nature seems to be of prevailing importance." He suggests

also that various emotions influencing the vegetative nervous system may play an important part.

Frankel and Schenck⁵ suggest that "all ectopic pregnancies, tubal or otherwise, occur because of nidation of the fertilized ovum in a locus of ectopic endometrial tissue to which the ovum is chemotactically attracted." Most investigators regard this as an exaggeration but do not deny that it may be a factor in a small number of cases.

There are many differences in opinion as to the etiology of ectopic pregnancy. There are obviously many factors involved, and it would probably be safe to say that each may play a part at one time or another.

PATHOLOGY

Litzenburg²⁵ summarized ectopic pregnancy adequately when he stated that "every physiologic process occurring in intrauterine pregnancy is repeated in ectopic pregnancy, but from the moment that the ovum penetrates the mucous membrane of the tube, every detail is pathologic because the tube is anatomically and histologically unsuited for a pregnancy."

The ovum implantation may be either columnar or intercolumnar, the latter being more common.³⁰ In intercolumnar implantation, the ovum burrows into the tube wall as it would into normal endometrium, but because of the lack of decidua and submucosa the process rapidly becomes pathologic. The decidua is normally a protective organ in intra-uterine pregnancies. In tubal pregnancies the decidua is not found in as great an abundance as in intra-uterine pregnancies. Novak²⁹ states the decidua present in tubes is patchy and imperfect. Litzenburg²⁵ says that "in the ovum bed there is no decidua, but only occasional decidual cells or at most patches, hence the term decidua basalis, as in intra-uterine pregnancy, should not be used; basalis being a better term." This "basalis" is made of an imperfect layer of decidual cells, connective tissue, and muscle cells which are partially destroyed by the erosive action of the trophoblast.²⁹

A capsularis is also found in tubal pregnancy, but it is not true capsularis as in intra-uterine pregnancy. The capsularis may contain decidual cells, but they are still not near as frequent as in intra-uterine pregnancy. Therefore the term decidua capsularis, as decidua basalis, is improper.²⁵ The capsularis may consist of tubal mucosa and muscle cells with often a fibrinoid layer.

As the ovum burrows into the tube wall, the basalis and capsularis are formed. The ovum's erosive action begins to weaken tissue and penetrate blood vessels. The vessels of the tube muscle are larger than in the uterine decidua basalis, and therefore the consequences are more serious. Hemorrhage into the inter-

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villous spaces may result which, along with the enlarging ovum, may place the capsularis externa under excessive pressure and cause an external tubal rupture. More frequently this hemorrhage may infiltrate the inner ovum capsule and cause an intratubal rupture. The inner ovum capsule, which is thin and eroded, cannot resist the growing ovum or hemorrhage as easily as the eroded tube wall; hence, intratubal rupture is more common than external tubal rupture.

Tubal pregnancy may terminate in one of several ways.

1. Rupture of the inner ovum capsule with the ovum remaining attached to the tubal wall. Bleeding will usually continue in this case and trickle into the cul-de-sac, forming a hematocele. If the fimbriated extremity is occluded, however, a hematosalpinx may be the result. Litzenburg²⁵ states that this is the more common fate of tubal pregnancy, and Eastman¹¹ says it occurs ten times as often as complete separation of the ovum from the tube wall.

2. Rupture of the inner ovum capsule with separation of the ovum from the tube wall. Bleeding in this case may continue until the ovum is extruded into the peritoneal cavity. It is probably the force of the blood which expels the ovum and not the action of the tube.²⁶ This is the so called tubal abortion which Litzenburg²⁶ believes may possibly happen but is certainly not the general rule.

3. Tubal rupture. In this case the erosion of the trophoblast has weakened the tube wall and opened vessels, causing the tube to perforate. Bleeding may be slight or profuse. If it occurs between the folds of the broad ligament, a hematoma may result.

4. Broad ligament pregnancy. After tubal rupture along the mesosalpingeal border, the early pregnancy may be extruded into the broad ligament. If the amnion remains intact and only the peripheral segment of the chorion has been traumatized, the dislodged embryo survives and may occasionally go to term,⁴³ although fetal death is the rule.

5. Secondary abdominal pregnancy. This may sometimes occur after tubal rupture when the trophoblast is not entirely extruded and gradually becomes weaned from the tube.

6. Spontaneous regression. This occasionally will occur if bleeding is not severe.

7. Lithopedion formation or mummification.

8. Tubal hydatidiform mole or chorionepithelioma.

9. Tubal term pregnancy. In 1953 Frachtman¹⁴ stated that only 75 cases of tubal pregnancy going to term were known. Fetal mortality in those cases was 80 per cent.

As can be concluded from the above, if there is blood in the abdomen, the tubal pregnancy must

necessarily have ruptured either externally into the peritoneal cavity or internally through the inner ovum capsule. Bell and Ingersoll,² Crawford and Hutchinson,⁹ and Smith³⁷ report 67 per cent, 88 per cent, and 89.8 per cent, respectively, of their patients had a hemoperitoneum. At Kansas University, 65 (81.25 per cent) patients were found to have hemoperitoneum at surgery.

The distal third of the tube has been found to be the most frequent site of tubal pregnancy. Table V illustrates the site of tubal involvement as reported by various investigators.

Of the 80 cases at Kansas University, 78 were tubal pregnancies, one was a cornual pregnancy, and one was an abdominal pregnancy.

TABLE V
SITES OF TUBAL PREGNANCY AS REPORTED BY
VARIOUS INVESTIGATORS

<i>Reporter</i>	<i>Proximal Third</i>	<i>Middle Third</i>	<i>Distal Third</i>
Kansas University	15.71%	31.42%	52.85%
Crawford et al. ⁹	14.00%	39.00%	46.00%
Priddle et al. ³³	15.00%	34.00%	44.00%

SYMPTOMS

Most symptoms of ectopic pregnancy can be attributed to tubal rupture or rupture of the inner ovum capsule. The main part of this discussion will cover the classical triad of pain, vaginal bleeding, and amenorrhea.

Pain. This is the most frequent symptom of ectopic pregnancy, as most investigators will agree (Table VIII). If rupture has not occurred, the pain may be mild, intermittent, and localized to one of the lower abdominal quadrants.⁴ With rupture there is usually a sudden onset of sharp, severe, cramping pain which may be constant or intermittent. Pain is usually more severe on the side of gestation. This pain may regress, only to return again, occasionally of a more severe nature. It may sometimes be referred to the chest, shoulder, umbilicus, flank, rectum, suprapubic region, or leg. If the hemorrhage is great there may be generalized abdominal pain. Pain may be initiated by straining at stool, by any exertion, or while doing nothing. Many patients complain of painful bowel movements. Dysuria and dyspareunia are occasional complaints.

At Kansas University, 79 (98.75 per cent) patients complained of pain. It was located in the same lower abdominal quadrant as the gestation in 38 (47.50 per cent) patients. Table VI a. and b. gives the description and location of pain and its frequency in Kansas University's 80 patients.



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Vaginal Bleeding. Most investigators find this to be the second most common symptom of ectopic pregnancy (Table VIII). It signifies death of the fetus or disturbance of fetal attachment⁴⁴ and is characteristically of endometrial origin, having its source in the venous channels of the endometrium.²⁸ It is initiated by separation of the placenta although other factors, probably of a hormonal nature, are concerned in its continuance for many weeks. Novak and Darner²⁸ theorize that "the source of this factor in keeping up the bleeding is probably in some unknown way associated with the persistence of trophoblastic elements in the tubal wall long after actual death of the embryo." Bleeding is usually spotting in amount and may or may not be preceded by amenorrhea. Seldom is it profuse. Patients usually describe the color as dark although it may occasionally be bright red.

At Kansas University, 72 (90 per cent) patients had vaginal bleeding. It was described as spotting by 47 patients. Eleven patients described the color as dark, four as bright red, five as both dark and bright red, and three as pink. Descriptions were not available from the remaining patients.

Eastman¹¹ says that in approximately a third of such patients, pain precedes vaginal bleeding, in a third vaginal bleeding precedes pain, and in another third pain and vaginal bleeding occur simultaneously. At Kansas University 26 (32.50 per cent) patients described pain as preceding bleeding, 45 (56.25 per cent) described bleeding as preceding pain, and 9 (11.25 per cent) reported bleeding and pain as occurring simultaneously.

Amenorrhea. This is generally accepted as the third most common symptom of ectopic pregnancy (Table VIII). It is, of course, dependent upon the survival of the embryo and may therefore be of variable duration. Many patients will not have amenorrhea since death of the fetus or disturbance in fetal attachment may occur before the due period. Jones,¹⁹ therefore, does not think it wise to place too much reliability on its presence or absence.

At Kansas University, 50 (62.50 per cent) patients gave a history of amenorrhea. The average duration was 24.14 days, but in the majority of patients it lasted two weeks or less (Table VII).

Nausea and Vomiting. These are probably due to peritoneal irritation. Crawford and Hutchinson⁹ reported 48 per cent of their patients experienced vomiting and 29 per cent nausea. At Kansas University, 30 (37.50 per cent) patients complained of nausea and 28 (35 per cent) of vomiting.

Fainting and Weakness. Fainting is probably the most talked about symptom of ectopic pregnancy. It is almost always included in a discussion of the classical picture. Crawford and Hutchinson,⁹ however,

TABLE VI a
PATIENTS' DESCRIPTION OF PAIN AND FREQUENCY AT KANSAS UNIVERSITY MEDICAL CENTER

<i>Patients' Description of Pain</i>	<i>Frequency Described</i>
A. Severe in character	44
B. Cramping in character	37
C. Acute in onset	27
D. Sharp in character	21
E. Dull in character	6

TABLE VI b
LOCATION OF PAIN AND FREQUENCY DESCRIBED BY KANSAS UNIVERSITY'S 80 PATIENTS

<i>Location of Pain</i>	<i>Frequency Described</i>
A. Same quadrant as gestation	38
B. Lower abdomen	26
C. Generalized abdominal pain	8
D. Epigastric region	4
E. Chest	4
F. Dysuria	18
G. Pain on bowel movement	18
H. Shoulder pain	8
I. Suprapubic region	8
J. Dyspareunia	6
K. Radiated to flank	6
L. Radiated to rectum	5
M. Pain on breathing	4
N. Radiated to umbilicus	3
O. Radiated to leg	2

found it occurred in only 21 per cent of their patients. At Kansas University Medical Center, 17 (21.25 per cent) patients described a fainting episode. Crawford and Hutchinson⁹ stated that 29 per cent of their patients complained of weakness. Giving this symptom at Kansas University were 23 (28.75 per cent) patients.

Urinary Symptoms. Irritation of the peritoneum covering the bladder is usually responsible for these symptoms. At Kansas University, 12 (15 per cent) patients complained of frequency of urination. Other urinary symptoms (dysuria and suprapubic pain) are mentioned above under the discussion of pain.

Bowel Symptoms. These symptoms are also due to peritoneal irritation by blood. Urge to defecate and painful bowel movements, the most outstanding, are

TABLE VII
DURATION OF AMENORRHEA OF 50 PATIENTS AT THE KANSAS UNIVERSITY MEDICAL CENTER

<i>Duration of Amenorrhea</i>	<i>No. of Patients</i>
7 days or less	13
8 through 14 days	13
15 through 21 days	7
22 through 28 days	6
29 through 56 days	7
Over 56 days	4

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mentioned above. Constipation was mentioned by 12 (15 per cent) patients at Kansas University. Diarrhea was mentioned by four patients.

Other Symptoms. Tingling of the breasts, tender breasts, enlarged breasts, leukorrhea, and shortness of breath were mentioned by five, seven, seven, five, and two patients, respectively.

PHYSICAL EXAMINATION

Abdominal Examination. On palpation of the abdomen, abdominal tenderness is the most frequent finding.^{4, 9, 44, 45} It may be entirely lacking, moderate, or severe. Occasionally it may be generalized, but frequently it is localized to one side. Rigidity may be found, but Word⁴⁴ states it will not be present un-

TABLE VIII
FREQUENCY OF THE CLASSICAL TRIAD OF
SYMPTOMS AS REPORTED BY VARIOUS
INVESTIGATORS

Investigator	Pain	Bleeding	Amenorrhea
Kansas University	98.75%	90.00%	62.50%
Word et al. ⁴⁴	98.7	88.0	76.4
Jones ⁴⁹	100.0	50.0	...
Word ⁴⁵	97.8	90.7	62.8
Torpin ⁴⁰	96.0	92.0	75.0
Johnson ¹⁷	93.5	42.3	...
Smith ³⁷	100.0	59.5	93.7
Ware, Winston ⁴¹	98.6	84.0	...
Crawford, Hutchinson ⁹	94.0	70.0	75.0
Bell, Ingersoll ²	92.0	83.8	...
Bookrajian, Luther ⁴	98.4	73.5	68.0

less the patient is seen shortly after the initial rupture. After the initial stage of bleeding has passed, the abdomen may become distended and doughy. Abdominal palpation may reveal a mass, but this is not the general rule. Occasionally percussion may reveal flank dullness if there is much blood in the abdomen. Table IX illustrates the various abdominal findings at Kansas University.

Pelvic Examination. The findings on pelvic examination are frequently of immense value in arriving at a diagnosis of ectopic pregnancy. The cervix may or may not be soft, may be blue in color, and not infrequently is painful on movement. Eastman¹¹ rates pain on cervical motion as by far the most frequent physical finding, but other investigators do not entirely support this statement.^{4, 44, 45} Pain on cervical motion is usually attributed to irritation of the peritoneum by blood, and therefore it is not a specific finding of ectopic pregnancy. The uterus is not uncommonly enlarged because of the estrogen action by the placenta. It may also be pushed to the side by the pelvic mass. On examination of the adnexa, a mass is commonly found which may or may not be tender. The mass is usually soft and elastic but may be firm. If there has been bleeding which has reached

the cul-de-sac, a doughy mass may be found there. Table IX illustrates the findings at Kansas University.

Temperature. Temperature may be an extremely good means of distinguishing ectopic pregnancy from pelvic inflammatory disease. Temperature in ectopic pregnancy rarely goes over 100 degrees. On rupture it may drop, but with absorption of blood it may later rise. At Kansas University the temperature range was from 96 through 100.6 degrees on admission and was over 100 degrees in only two patients.

Blood Pressure and Pulse. These are important in ectopic pregnancy, mainly to evaluate the patient in regard to shock. As might be expected, blood pressure drops in proportion to suddenness and extent of the rupture. Many investigators put much faith on pulse as an indication of tubal rupture. At Kansas University the pulse rate was over 100 on 27 (33.75 per cent) patients. The blood pressure was 90 systolic or below in 12 patients and 100 systolic or below in 20 patients.

Shock. Word⁴⁴ states that many patients go into a shock-like state initially with a blood loss of only a few ounces. These patients usually recover promptly. If, however, bleeding continues rapidly, the patient may go into true shock. When the patient goes into shock does not necessarily depend upon the amount of blood lost but more probably depends upon the rapidity of its spill into the peritoneal cavity.⁴⁴ At Kansas University Medical Center, 9 (11.25 per cent) patients were in true shock on admission.

TABLE IX a
FINDINGS ON ABDOMINAL EXAMINATION OF
80 CONSECUTIVE CASES AT KANSAS
UNIVERSITY MEDICAL CENTER

Finding on Abdominal Examination	Frequency Found
A. Abdominal tenderness	66 patients
B. Rebound tenderness	31
C. Abdominal mass palpable	13
D. Abdominal rigidity	9
E. Abdominal distention	6
F. Flank dullness	2

TABLE IX b
FINDINGS ON PELVIC EXAMINATION OF 80
CONSECUTIVE CASES AT THE KANSAS
UNIVERSITY MEDICAL CENTER

Findings on Pelvic Examination	Frequency Found
A. Mass in adnexa	54 patients
B. Adnexal tenderness	37
C. Pain on cervical motion	31
D. Enlarged uterus	28
E. Doughy fullness in cul-de-sac	27
F. Soft cervix	17
G. Uterus displaced	13
H. Blue cervix	11

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DIAGNOSIS

It must be emphasized that careful history and physical examination are extremely important in arriving at a correct diagnosis of ectopic pregnancy. Ectopic pregnancy is notorious for its confusing picture and the difficulty it causes the diagnostician. Various investigators have reported a correct preoperative diagnosis in 77.5 per cent,⁴⁴ 84.3 per cent,⁹ 70.9 per cent,⁴ 52 per cent,² and 87.1 per cent⁴⁵ of their patients.

At Kansas University the preoperative diagnosis was correct in 73 (91.25 per cent) patients; however, there are undoubtedly a few patients not included in this series who went to surgery with an incorrect diagnosis of ectopic pregnancy which would lower the percentage of correct preoperative diagnosis. The differential diagnosis usually consists of salpingitis, uterine abortion, appendicitis, torsion of an ovarian cyst, spontaneous rupture of a follicle or corpus lutein cyst with intra-abdominal hemorrhage, fibroids, and endometriosis. Various diagnostic aids will be discussed below.

Cul-de-sac Aspiration. Many investigators report aspiration of the cul-de-sac as a valuable diagnostic aid. Word,⁴⁵ Word et al.,⁴⁴ and Winkler and Capraro⁴² report culdocentesis as correct in 90 per cent, 92 per cent, and 92 per cent, respectively, of their cases. Eastman,¹¹ however, believes abdominal exploration to be safer than culdocentesis.

A positive culdocentesis is dependent upon extravasation of blood into the peritoneal cavity from a ruptured ectopic pregnancy. This blood clots, and the clot is agitated by motion of the patient and the intestinal tract. The peritoneum then reacts by expressing a transudate that mixes with serum, red blood cells, and fibrin from the clot.⁴⁵ This mixture is the material obtained on aspiration of the cul-de-sac. It can be distinguished from venous blood by two means: (1) venous blood clots within ten minutes whereas the material resulting from a tubal rupture will not; (2) if the material resulting from a tubal rupture is placed on a slide, flakes of fibrin will be seen, which is not true of venous blood. At Kansas University, culdocentesis was performed on 12 of the 80 patients with ectopic pregnancy. It was positive in nine cases and negative in three cases.

Hormonal Pregnancy Tests. There are many views on the value of hormonal pregnancy tests as an aid in the diagnosis of ectopic pregnancy. The tests are positive so long as there is live chorionic tissue growing in the genital tract. Of course intra-uterine pregnancy or incomplete abortion, as well as a corpus lutein cyst, may give a positive test. Frequently the time factor does not allow hormonal tests to aid in

diagnosis. At Kansas University Medical Center, hormonal tests were performed on 35 patients. Of these 25 (71.42 per cent) were positive and 10 (28.58 per cent) were negative. Crawford and Hutchinson⁹ as well as Bookrajian and Luther⁴ report 75 per cent of their tests as positive.

Curettage. The decidual reaction of the uterus is the same in an ectopic pregnancy as in a normal intra-uterine pregnancy. With death of the embryo in ectopic pregnancy, the superficial compact portion of the decidua with a considerable portion of spongy glandular layer is cast off.²⁸ After separation, this decidual tissue may not be expelled from the vagina for many days, when it may present as a large, complete, decidual cast or in smaller portions resembling menstruation. After disappearance of the decidua, the endometrium immediately begins regenerating.⁵ This explains why a curettage may reveal decidual tissue, proliferative, or secretory endometrium, depending upon the embryo's status. If decidua without chorionic villi is found on curettage, it may be a valuable aid in diagnosing ectopic pregnancy, but it is not conclusive. At Kansas University, six patients had curettages which revealed one decidua, two proliferative endometria, and three secretory endometria. Eleven patients passed a decidual cast.

Sedimentation Rate. Bookrajian and Luther⁴ believe the sedimentation rate to be of little value in diagnosing ectopic pregnancy. Word,⁴⁵ however, gives it some value in distinguishing ectopic pregnancy from acute salpingitis. At Kansas University, 73 sedimentation rates were performed, Table X showing the results.

TABLE X
RESULTS OF 73 SEDIMENTATION RATES AT
KANSAS UNIVERSITY MEDICAL CENTER

<i>Sedimentation Rate (mm./hr.)</i>	<i>Number of Cases</i>
10 or below	8
11 through 20	26
21 through 30	33
Above 30	6

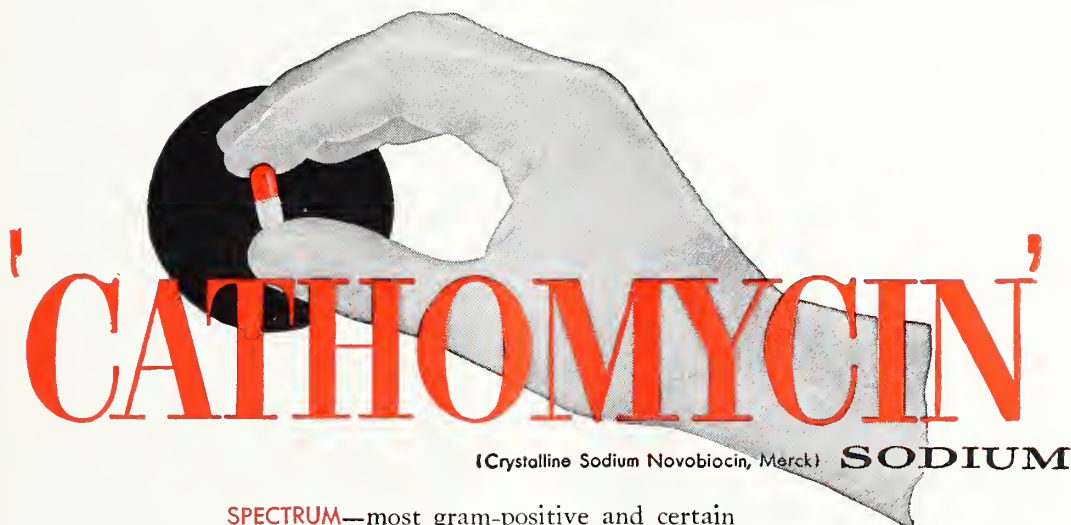
White Cell Count. Eastman¹¹ believes the white count to be of little help in the diagnosis of ectopic pregnancy. He states that in cases of old rupture or slow leak, the count is likely to be normal, whereas after sudden massive hemorrhage it may be over 15,000. Bookrajian and Luther⁴ report leukocytosis to be a rather prominent feature. Smith³⁷ reported an average white count of 10,260, while Crawford and Hutchinson⁹ found 90 per cent of their patients had white counts of 10,000 or over. At Kansas University, 40 (50 per cent) patients had white counts of 10,000 or more on admission and 15 (18.75 per

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cent) patients had 15,000 or over. The average white count was 10,979.

Red Cell Count and Hemoglobin. Shortly after rupture with severe bleeding, the red count may not be significantly altered. When the body fluids have had time to dilute the circulating blood, the red cell count may be reduced.¹² It should also be kept in mind that pregnant women may have anemia due to other causes. The same general statements also apply for hemoglobin. At Kansas University Medical Center, 19 (23.75 per cent) patients had red counts below three million, while only three counts were below two million. Table XI shows hemoglobin findings.

TABLE XI

RESULTS OF HEMOGLOBIN ON 80 PATIENTS AT THE KANSAS UNIVERSITY MEDICAL CENTER

Hemoglobin in Per Cent	No. of Patients
50 or below	15
51 through 60	10
61 through 70	19
Above 70	36

Other Aids. Other aids which may be used in evaluating ectopic pregnancy are posterior colpotomy,¹⁰ hysterosalpingography,²³ culdoscopy,⁴⁴ peritoneoscopy,² oral basal temperatures,³⁸ and examination under anesthesia. Of these K.U.M.C. performed three colpotomies with positive results and nine examinations under anesthesia, all of which were helpful in arriving at the diagnosis. Oral temperatures were helpful in evaluating a tubal abortion which did not require surgery.

TREATMENT

In patients who have a ruptured ectopic pregnancy and have lost much blood, treatment should be immediate surgery with simultaneous use of supportive measures such as whole blood and oxygen. Pisani³² believes the advantages of this are as follows: a lowered mortality rate; the bleeding point is directly controlled; early resuscitation and treatment of anoxia are achieved; secondary hemorrhage is prevented; smaller amounts of whole blood are usually required; metabolic changes secondary to prolonged hemorrhage are prevented; there are fewer post-operative complications. Mortality from ectopic pregnancy will be lessened greatly if little time is lost in making a correct diagnosis so surgery may be performed. At K.U.M.C., the average time between admission and surgery was 45.26 hours. There was no mortality.

Most investigators believe that surgery should be

limited to that which is necessary such as a unilateral total salpingectomy or salpingo-oophorectomy, partial hysterectomy, removal of an ectopic pregnancy from the pelvic or abdominal cavity, or salpingotomy and repair of the involved tube. Table XII presents the types of surgery performed at K.U.M.C.

Campbell⁶ found that those patients who had incidental surgical procedures did as well, as a group, as those who had only specific surgery, but he still suggested specific surgery only. Word⁴⁵ says, "If tubal pregnancy is unruptured or there is minimal hemorrhage, other indicated surgery may be performed, depending upon the patient's condition and the good judgment and skill of the surgeon."

In the suspected case of ectopic pregnancy where findings do not warrant a laparotomy, the patient should be hospitalized immediately and placed on complete bed rest. Blood should be typed and cross matched and diagnostic aids such as hormonal tests, complete blood count, and urinalysis carried out. Hemoglobin, blood pressure, and pulse should be watched closely. If, after this, the diagnosis is still in question, there are avenues such as culdocentesis, curettage, examination under anesthesia, and others which may be followed.

Whole blood is an extremely important part of the treatment of ruptured ectopic pregnancy. Some investigators, such as Smith²⁷ and Bookrajian et al.⁴ believe shock should be corrected with whole blood before any surgery is performed. Pisani³² believes that transfusions before surgery may raise the blood pressure, causing more bleeding, and little is to be gained unless surgery is carried out before, during, or immediately after blood replacement. Eastman²¹ says, "It is unwise to start operating on a shocked woman until blood is actually running into her veins." At K.U.M.C., 66 patients received an average of 1,095 cubic centimeters of whole blood before, during, or after surgery.

Ware et al.⁴¹ believe that oxygen is important in the management of a patient who is in shock or in poor condition. They start nasal oxygen immediately on admission to the hospital and continue it until the patient's pulse drops and she is in good condition.

The anesthetic of choice for ectopic pregnancy is probably cyclopropane with minimal premedication. Cyclopropane has a beneficial effect on pulse, blood pressure, and peripheral circulation following hemorrhage, and high levels of oxygen can be maintained. Ether is probably a poor choice since it dampens compensatory responses of the capillary bed. Fifty-five patients at K.U.M.C. received cyclopropane as the primary agent, 14 had spinals, and nine had pentothal with nitrous oxide. Information on the

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type of anesthesia used was not available on one patient.

TABLE XII

ANALYSIS OF THE TYPE OF SURGERY DONE
FOR 80 PATIENTS AT THE KANSAS
UNIVERSITY MEDICAL CENTER

<i>Type of Surgery Performed</i>	<i>No. of Times Performed</i>
A. Salpingectomy	38
B. Salpingo-oophorectomy	20
C. Bilateral salpingectomy	2
D. Salpingectomy and salpingo-oophorectomy	2
E. Salpingectomy and salpingoplasty	1
F. Salpingo-oophorectomy, salpingoplasty, and appendectomy	1
G. Salpingoplasty	1
H. Salpingo-oophorectomy and appendectomy	2
I. Salpingectomy with hysteropexy	1
J. Supracervical hysterectomy and salpingo-oophorectomy	2
K. Total hysterectomy with salpingectomy and salpingo-oophorectomy	3
L. Complete hysterectomy with bilateral salpingectomy	2
M. Complete hysterectomy with salpingectomy	2
N. Removal of a foreign body from peritoneum with total hysterectomy and salpingectomy	1
O. Exploratory laparotomy	1
P. No surgery necessary	1

PROGNOSIS

The mortality of ectopic pregnancy has gradually been dropping until today there are many observers, such as Crawford et al.⁹ and Bell et al.,² who report their mortality as being zero. Leff²⁴ recently made a 37-year survey of ectopic pregnancy and found that mortality had dropped tremendously. Mortality has recently been reported by various investigators as 0.8 per cent,⁴ 0.4 per cent,⁴¹ 0.4 per cent,¹⁰ 0.25 per cent,⁶ 1.6 per cent,¹ 2.9 per cent,³³ and 1.33 per cent.⁷ Of the 80 patients at K.U.M.C., there was not a single death. Eastman¹¹ believes mortality to be due to four factors which are as follows: (1) failure of the physician to realize the urgency of the situation; (2) delay in hospitalization; (3) delay in surgery; (4) too late and too little whole blood.

Once a patient has had an ectopic pregnancy, her chances of having another are approximately 30 times greater than for the woman who has never had one.¹¹ Various investigators have reported the incidence of repeat ectopic pregnancy as 4.05 per cent,⁶ 3 per cent,⁴¹ 14.3 per cent,⁸ 4.1 per cent,¹⁹ 4 per cent,⁹ 7 per cent,⁷ and 3.5 per cent.¹⁰ At Kansas University Medical Center, 4 (5 per cent) patients had had a previous ectopic pregnancy.

Once a woman has had an ectopic pregnancy, her chances of having a future normal pregnancy are greatly reduced. Grant,¹⁶ after analyzing 259 cases, says that after the occurrence of ectopic pregnancy,

less than a third of the patients will succeed in producing a live baby for the rest of their reproductive lives.

SUMMARY

1. The history of ectopic pregnancy is briefly reviewed.

2. The incidence of ectopic pregnancy is increasing in direct proportion to the increase in childbirth, more frequent use of antibiotics in treating salpingitis, and clinicians becoming more aware of the condition. The colored race and women with sterility problems generally show an increased incidence of ectopic pregnancy.

3. Etiology is discussed under the general theory that anything which would disturb or delay ovum transportation, of which there are many, may cause ectopic gestation. At Kansas University Medical Center, salpingitis seemed to play a prominent role.

4. The pathology of ectopic pregnancy is compared to normal intra-uterine pregnancy, and emphasis is placed on the fact that ectopic pregnancy is a pathologic process from its beginning. Possible terminations of tubal gestation are discussed. It was found that the distal third of the tube most frequently harbored ectopic pregnancy.

5. Most common symptoms were found to be the classical triad of pain, vaginal bleeding, and amenorrhea. These were described in detail, and other minor symptoms were mentioned.

6. Abdominal tenderness, adnexal mass, and adnexal tenderness were found to be the most frequent physical findings. It was found that the temperature in ectopic gestation rarely exceeds 100 degrees.

7. The importance of the history and physical examination in the diagnosis of ectopic pregnancy is emphasized. It is still a difficult diagnosis and one frequently missed. Various diagnostic aids and their value are discussed.

8. The importance of early diagnosis so that surgery may be instituted is emphasized in the treatment of ectopic pregnancy. The value of whole blood in lowering the mortality rate is discussed.

9. The mortality rate of ectopic pregnancy is steadily decreasing. Women who have had an ectopic pregnancy have a greater than normal chance to have another, and their chances for a future normal pregnancy are reduced.

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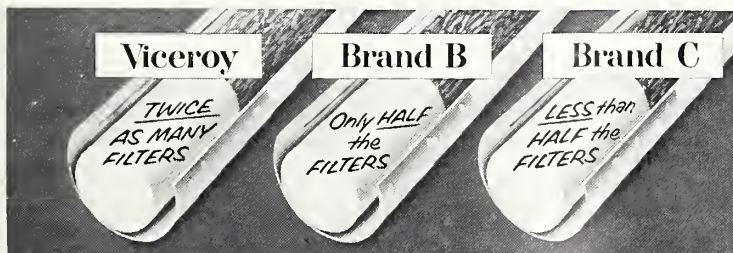
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Minimum Care Unit Established

A minimum care unit for patients needing only minor surgery and treatment was established recently by the Hartford, Connecticut, Hospital to relieve a shortage of regular hospital beds and to care for more patients without increasing the number of nurses on duty. The experiment proved successful.

The original intention, according to Dr. Ernest C. Shortliffe, assistant director of the 704-bed hospital, was to assign to the unit only patients whose doctors had certified that a minimum amount of nursing care was required. Later, however, it was decided to run an experimental unit of 20 beds for patients whose hospital stay was expected to be no longer than six days and whose conditions indicated that minimum professional nursing care would suffice. This included those admitted for diagnosis, minor gynecological procedures, and persons requiring daily treatment in the department of physical medicine.

The hospital reports that the plan quickly reduced its long list of persons waiting for admission.

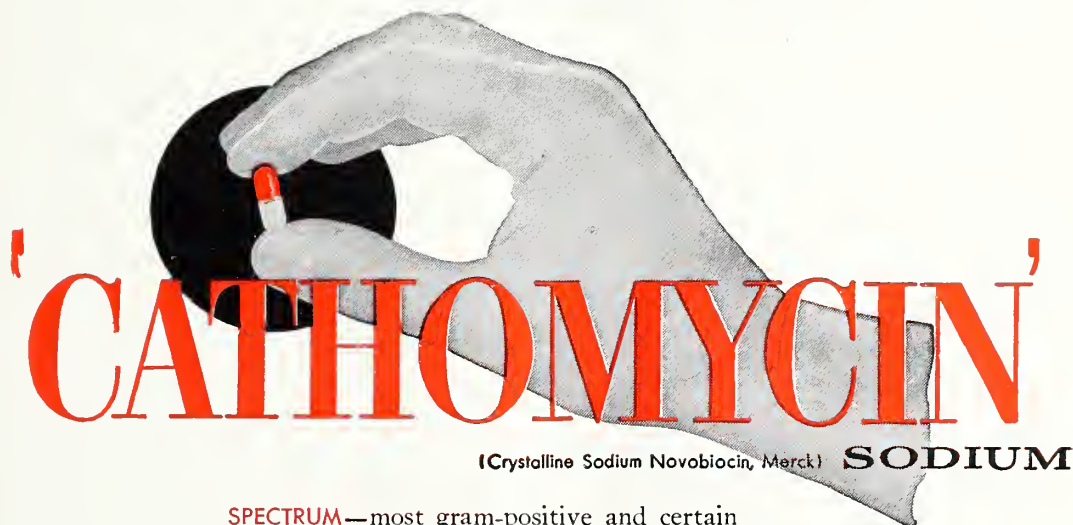
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ANNOUNCEMENTS

Annual congress, United States and Canadian Sections, International College of Surgeons, Palmer House, Chicago, September 9-13. Write Secretariat of the College, 1516 Lake Shore Drive, Chicago 10, Illinois.

Twenty-nine courses in postgraduate medicine offered by Post-Graduate Medical School, New York University, 550 First Avenue, New York 16, New York, beginning in September. Courses available in surgery, anatomy, anesthesiology, dermatology and syphilology, industrial medicine, medicine, neurology, obstetrics and gynecology, ophthalmology, otorhinolaryngology, physiology, and radiology.

Mississippi Valley Medical Society meeting, Hotel Morrison, Chicago, September 26-28, open to members of A.M.A. Annual meeting of American Medical Writers' Association following, September 28 and 29. Write Harold Swanberg, M.D., 209 W.C.U. Building, Quincy, Illinois.

Annual meeting, American Rhinologic Society, Chicago, October 9-13. Write the Society, 834 Wellington Avenue, Chicago 14, Illinois.

Postgraduate courses on diseases of the chest, American College of Chest Physicians, Hotel Knickerbocker, Chicago, October 14-19, and Park-Sheraton Hotel, New York City, November 12-16. Tuition \$75. Write the College, 112 East Chestnut Street, Chicago 11, Illinois.

Course No. 5 sponsored by American College of Physicians, "Selected Problems in Internal Medicine," University of Oklahoma School of Medicine, Oklahoma City. Annual meeting, American College of Physicians, Boston, April 8-12, 1957. Write the College, 4200 Pine Street, Philadelphia 4, Pennsylvania.

National Institute of Neurological Diseases and Blindness, National Institutes of Health, offers traineeships for those who have completed residency training or its equivalent in a specialty and desire

training for careers as clinical investigators and educators in fields of neurological and sensory disorders. Write Chief, Extramural Programs, National Institute of Neurological Diseases and Blindness, Bethesda 14, Maryland.

Awards of \$500, \$300, and \$200 offered by American Urological Association for essays on results of research in urology. Closing date for entries, December 1. Write the secretary, 1120 North Charles Street, Baltimore.

National Meeting of Surgeons, Mexico City, Mexico, November 18-25. Open to members of International Academy of Proctology, American College of Surgeons, American College of Gastroenterology, and American Gastroenterological Association.

BOOK REVIEWS

Medical Writing. By Henry E. Sigerist, Hans Selye, Hugh Clegg, Walter C. Alvarez, and Felix Marti-Ibanez. Published by MD Publications, Inc., New York. 66 pages.

This book is in no way related to the flood of "How to Do It" volumes now available on every skill. It is intended as a presentation of the views on medical writing of five men who are themselves distinguished authors, and it makes for interesting reading.

Sigerist briefly describes how he writes a paper, and then moves on to the doctor's reading. Selye presents a discussion on "How Not to Write a Medical Paper," including mention of traps, fallacies, and warnings. Clegg, under the title "An Editor's Prejudices," speaks of style, the meaning of words, bibliographies, charts, and tables.

The budding author will find valuable suggestions in the article prepared by Alvarez. It is short, practical, and simply written. Ibanez confines himself to a discussion of what the physician reads and what he should read, defining three "intellectual circles of the physician," reading for recreation, reading for improvement, and reading of professional and scientific material.—P.F.

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Personal Health Record. By Carl A. Dragstedt, M.D. Published by Military Service Publications Company, Harrisburg, Pennsylvania. 64 pages. Price \$1.00.

The author of this little booklet, professor of pharmacology at Northwestern University Medical School, recorded his idea on the value of a lifetime personal health log in a signed editorial in the April 14 issue of the *Journal of the American Medical Association*. He suggested a record encompassing items from family history, vaccinations and inoculations, diseases and operations, blood pressure, blood cell counts, and similar laboratory findings. A patient having such a log could present it upon consulting a physician or entering a hospital, thereby saving time and providing information more accurate and reliable than that reported from memory.

The booklet designed by Dr. Dragstedt outlines space for those items and countless more. Although it was suggested as a "cousin" to the traditional baby book, it could replace the latter in all but sentimental values and add many advantages of its own, serving the patient from infancy throughout his lifetime.—P.F.

The Management of Strokes. By Keith W. Sheldon, M.D. Published by J. B. Lippincott Company, Philadelphia. 134 pages. Price \$3.00.

This little monograph in the series of "Practitioners' Pocketbooks" appears to offer little which is new in the understanding and treatment of the subject which it attempts to review and in many ways is a disappointing product of a noble effort.

Less than 11 of its 134 pages are devoted to the treatment of strokes, and even here there is little to be found which differs from the treatment needs of any bedridden patient—viz., adequate attention to sedation, airway, bladder, bowel, fluids, nutrition, and early rehabilitation. Much of the book is consumed with a "differential diagnosis of so-called strokes." Even here many of the examples are quite remote to the common problem germane to all medical practice, and the approach to the differential diagnosis is on a purely academic level. The most striking deficit is failure to indicate the total needs of the patient who has suffered the stroke, particularly with respect to the meaning of this catastrophe to him as an individual suddenly removed from the stream of productive living, his struggles with recognition and acceptance of his incapacities, and the hazards to his economic and social life as well as that of his family.

This book may be of some little use to the medical student but offers nothing to the physician most confronted with the "management of strokes," namely, the general practitioner.—J.A.S.

An opportunity to see three medical movies made in Russia was available to physicians who attended the American Medical Association session in Chicago last month. The films were selected for showing from a group of 10 productions of the Academy of Medical Science, U.S.S.R., recently exchanged for 10 medical films produced in this country.

CLASSIFIED ADVERTISEMENTS

GENERAL PRACTITIONER WANTED—Large trade area 60 miles Wichita, 17 miles Winfield. Community will provide funds for small clinic and equipment. Former doctor deceased. Chamber of Commerce, Burden, Kansas.

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*Modell, W.: The Relief of Symptoms, Philadelphia, W. B. Saunders Company, 1955, pp. 265-266.



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County Society Activities

Activities sponsored by the nation's county medical societies ran the gamut from alcoholism control to venereal disease detection during 1954-1955, according to a survey made by the American Medical Association. Replies to a questionnaire were received from 64 per cent of the societies in the United States and its territories.

The survey showed that the importance of county society scientific programs has been minimized by the increasing number of specialty society, postgraduate, and hospital staff meetings. Socio-economic aspects of medicine, however, are becoming increasingly important as meeting topics. Larger societies showed the greatest increase in attendance, but smaller societies enjoyed the highest percentage of attendance.

Most groups use special committees for providing service to members and to the public. The names of the committees indicate the following interests: ethics, grievances, telephone answering service, emergency calls, collection bureaus, physician assistance programs, hospital relations, liaison with voluntary health organizations, public health, school health, and mental health.

Medical societies are recognizing a growing need to interpret medical services to the layman, usually in the form of speakers bureaus. Other activities included health forums, state and county fair exhibits, and sponsorship of health days, radio programs, and television programs.

In the field of programs sponsored by voluntary and governmental agencies, county societies also participate. Most prevalent are indigent care programs. Also listed are cancer control, diabetes detection, tuberculosis control, blood bank plans, health examinations, venereal disease control, multiple screening programs, school health, safety programs, and rheumatic fever control.

A direct relationship between size of society and amounts of its dues was noted in the survey. Forty-three of the 68 societies reporting dues of more than \$40 have more than 100 members. The largest number of societies reported dues of \$5.00 or less, but 90 per cent of that group have fewer than 100 members.

Dr. Dwight H. Murray, Napa, California, who took office as president of the American Medical Association in June, will be followed in office by Dr. David B. Allman, Atlantic City. Dr. Allman has been a member of the Board of Trustees of the A.M.A. since 1951.

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CHLOROMYCETIN is a potent therapeutic agent, and because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

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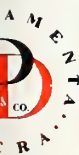


TABLE OF CONTENTS

SEPTEMBER, 1956

Scientific Articles

- Rehabilitation: Restoration of Function after Fractures Is an Important and Sometimes Neglected Feature of Their Treatment—Charles R. Rombold, M.D., Wichita . . . 535
- Heart Disease: A Study of Blood Ammonia Levels in Congestive Heart Failure with Report of Three Cases—W. Graham Calkins, M.D., and Mahlon Delp, M.D., Kansas City . . . 538
- Biopsy: Panel Discussion on Its Role in the Spread of Cancer—Guest Speakers, University of Kansas Medical Center Postgraduate Course in Surgery . . . 545
- Cardiovascular Laboratory: Report of Activities at University of Kansas Medical Center,

- May 1953 to May 1955 . . . 551
- Clinicopathological Conference—Recurrent Pulmonary Infiltration, Eosinophilia, and Terminal Neurologic Signs . . . 564
- Senior Thesis—Hypophosphatemic Rickets: Description and Case Reports of Renal Tubular Form of This Deficiency Disease . . . 582

Editorials

- What's Wrong with Medical Organizations . . . 557
- The Chaplain and Medicine . . . 558

Miscellaneous

- President's Page . . . 556
- Just Browsing . . . 562

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The JOURNAL *of the* KANSAS MEDICAL SOCIETY

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Volume LVII

SEPTEMBER, 1956

No. 9

Rehabilitation

Restoration of Function after Fractures Is an Important and Sometimes Neglected Feature of Their Treatment

CHARLES R. ROMBOLD, M.D., *Wichita*

Rehabilitation of fractures of the spine presents problems of a character and divergence not presented by fractures of long bones. Long bones, mechanically, have as their only function the ability to transfer weight. The spine also must transfer weight but must function in addition as a highly mobile column, and as a further duty must protect the spinal cord. To provide the means of performing these additional functions, the architecture of the spine must be unique and is expressed by the intricate form of the vertebrae, by their multiple areas of contact, by their relationship to the intervertebral discs, and by the intervertebral discs whose structural characteristics are dissimilar to any other tissue in the body.

Injuries to the articular surfaces of the vertebrae may cause pain in a manner similar to that produced by comparable injuries to the joints of the long bones. However, because vertebrae present so many areas of contact, these opportunities are multiplied. Also, the alteration of the shape of any part of a vertebra, such as a compression of its body, will result in a derangement of the mechanics of several joints instead of only one or two in long bones. The intervertebral disc, because of the structural mobility required by its function, is highly vulnerable to trauma; and the spinal cord and nerve roots encased within the vertebrae for protection may, because of the very contiguity of the protection, suffer severe and irreparable damage. These factors set aside spine injuries as a specific problem.

Residual fractures of the thoracic area rarely require treatment. Mobility in this area is limited. The

spine is supported and stabilized somewhat by the ribs, and there is little weight to be carried. Occasionally a brace is advisable but rarely required. In the lumbar area, however, with a great range of motion between the vertebra and with the torso load to

This is the third article in a four-part series. Part I was published in the July issue of the Journal, Part II appeared in August, and the final installment will be printed in October.

be carried, occasionally a fusion may be required if a brace gives inadequate relief of disability. In all areas of the spine, if an intervertebral disc has been sufficiently damaged, there may be a definite residual disability. The occasional course of healing results in a bony bridging of the disc ankylosing the adjacent vertebra with relief of symptoms. If this happy intervention of healing is denied, then support either by a brace or by surgical fusion of the adjacent vertebra may be indicated. This procedure may be advised with confidence in a good end result. Loss of motion between two or three vertebrae, even in the cervical or lumbar area, results in little disability, and the relief from pain is adequate compensation for whatever loss of motion eventuates.

Residual fractures of the cervical spine, providing the posterior elements are competent and not dis-

placed, rarely require treatment. However, if without paraplegia there is an ununited fracture through the pedicles, or if there is an anterior dislocation of a vertebra, a severe instability exists and a paraplegia is impending, to be precipitated by minor trauma. In such a situation the patient's luck may be considered to be exhausted and a spinal fusion advised.

Not infrequently the sequelae of the treatment of spine fractures are more disabling than if the fracture had been left untreated. I am certain you have heard many old physicians say that their fracture results were much better before x-rays were available than they were after x-rays were easily obtained. If there is any group of fracture cases where this dictum is pertinent, it is in compression fractures of the bodies of the lower thoracic and lumbar vertebrae.

For years we have been placing these patients in hyperextension casts with postreduction x-ray evidence of excellent correction of the compression. Many have been ambulatory early, exercising and even working with minimal complaint while immobilized. However, after the cast has been removed and the subsequent brace discarded, symptoms continue and multiply. Usually the subjective complaint has been localized in the lumbosacral area rather than in the area of fracture, and it has been this localization we have ignored.

The cause of the lumbosacral pain is easily explained; it is secondary to the hypertension cast and is not secondary to the fracture per se. The lumbar lordosis inherent in the upright posture is the parent of most of the low back complaints in the so-called normal back. In a hyperextension cast this lordosis is increased, and it is maintained for months in this augmented position. The ligaments and the intervertebral discs involved eventually succumb to the constant tension and pressure, and a permanent disability of the lumbosacral area is the sequela of the treatment of a fracture of a lumbar or thoracic vertebra.

Since we have had the courage to accept a moderate compression of a vertebral body and have ceased attempting to correct it, we have had much improved results. Our present treatment of a moderate compression of a vertebral body is a few days' bed rest followed by a light brace, occasionally only a corset, early ambulation, and function. We make an earnest attempt to ignore the fracture, and we have aided our patients best by treating them least.

Fractures of the spine with paraplegia, often quadriplegia, present a distressing, discouraging problem. The most that can be offered to these unfortunate patients is the effort to rehabilitate them around their disability, not relieving them of it. It is occasionally amazing what can be accomplished by the exercise of a will to do, patience, opportunism, and training.

Certainly if the upper extremities are paralyzed, little can be done except in the occasional case where a muscle transplant, a wrist fusion, or a bone block in a thumb may increase the functional value of a hand.

If, however, adequate function remains in the upper extremities, and if the patient has a determination to rehabilitate himself, much can be done to assist him. The severe clonic contractures frequently exhibited by these patients can be controlled by rhizotomy or better by alcohol injections intrathecally. Fixed contractures can be released by division or lengthening of tendons. Crutches and braces may allow ambulation. Training frequently results in an automatic bowel and bladder. Invention, substitution, and opportunism frequently solve the problems of a paraplegic's job, and many become adequate employees. The aptitude tests and vocational training afforded by the Division of Vocational Rehabilitation have proved beneficial in training these patients, and this help has been readily available.

LIMITATION OF MOTION OF JOINTS

It is almost axiomatic that any fracture will result at least temporarily in some limitation of range of motion in contiguous joints. This complication is more frequently found by the patient than considered by the physician when treatment is instituted. There has been a valuable evolution in the treatment of fractures which has tended to lessen this serious complication, inspired by this fear of the patient and also by the aspiration of the thoughtful physician. However, even with improvement resulting from progressive treatment techniques, the frequency and degree of limitation of motion is too often a major calamity. Treatment procedures based on early and frequent joint movements are not yet practiced sufficiently to place this complication in the limbo it deserves.

Fracture may cause limitation of motion in a contiguous joint as a result of:

1. Adhesions within the joint capsule.
2. Adhesion between the synovia-capsule structures and the articular surfaces.
3. Contractures of muscles immobilized in an unphysiological position.
4. Incarceration of muscle in the healing process at the fracture site.

This group of fracture complications may be treated better by prevention than by correction. However, some form of stretching is indicated if there is a significant resulting limitation of motion which is secondary to adhesions in the synovia-capsule mechanism or muscle contracture. If stretching is to be instituted, a clear distinction must be made between synovia-capsular adhesion and the pathology in those cases in which muscle or tendon has become incorporated

in a callous scar. Adhesions as a result of inactivity and disuse of the synovia-capsular tissues are fine and friable and may be easily broken up by stretching. On the other hand, adhesions resulting from organized hemorrhage will be heavy fibrous tissue of great strength. An attempt to stretch a firm scar of this type might easily result in multiplying the complication.

Organized scar will maintain its integrity in the face of vigorous assault. Devitalized normal tissue may give way as is attested by many patellae resulting from forceful flexion of knees whose quadriceps were bound in the scar of a fractured femur. Therefore, before any stretching maneuvers are employed to increase the range of motion in a joint, the character and location of the pathology must be carefully evaluated. Stretching offers no solution for those cases in which the pathology is organized scar incorporating the motors of a joint.

Quite certainly the most valuable assist in regaining lost joint range is a purposeful function which produces stretching. If the part to be treated can be employed in some remunerative, necessary, or pleasurable task it will be exposed to more consistent and effective stretching than can be supplied in any other manner. It has been noted that removing the factor of necessity, as accomplished by industrial compensation payments, frequently results in retarded recovery. Thoughtful ingenuity on the part of the physician and his patient will frequently develop an activity which will be therapeutically beneficial. Piano playing, typewriting, dishwashing, card playing, sewing, working with hand tools, etc., employed several hours a day, will do more to improve a stiff hand than the most efficient physical therapist can accomplish in a daily half-hour treatment. Similar purposeful uses for the other joints of the extremities and spine can be developed by a little consideration of the problem in the light of the patient's capacities, training, and inclinations.

In re-establishing lost joint motion, the value of an experienced physical therapist should not be under-rated, particularly in the treatment of early cases. The patient frequently requires the patience, guidance, and confidence-inspiring services of a physical therapist. However, after painless movement in even a limited range has been achieved, active purposeful motion is superior therapy. The physical therapist then should treat the patient frequently enough to maintain his interest in his improvement and to devise new active functions to maintain constant attack on the adhesions.

Mechanical stretching devices maintaining constant attack on the capsule-synovial adhesions can be effective. Turnbuckle, spring, rubber, or traction appliances exert their force directly at the site of the con-

tracture because the protection of the muscles motivating the joint is eliminated early by their tiring. Ingenuity is required by the physician in developing these mechanical aids as each must be developed for each individual case. When these constant forces are employed, it must be remembered that new adhesions may be formed in the contralateral tissues. New contralateral adhesions can be prevented by an occasional repetition of the full range of attainable motion in the joint.

Cases which have a limitation of joint motion secondary to a muscle or tendon being entrapped in the scar of the callous offer a poor prognosis for effective improvement. In the upper extremity, other than a poor cosmetic result, little disability eventuates, but a marked limitation of flexion in a knee can be disabling. Stretching procedures are ineffective, and surgical measures have been disappointing. Occasionally flexion can be recouped in a knee by resection from the patella of the three deep bellies of the quadriceps, leaving the long head to activate extension of the joint. In those patients requiring maneuverability instead of stability, it is a procedure offering a possibility of improvement. Probably, in most cases where the muscles are importantly enmeshed in scar, acceptance of the resultant disability with development of adroit maneuvers to circumvent its effect is the approach of choice.

Not infrequently, particularly in Pott's fractures and fractures of the humerus, limited joint motion is primarily a result of contracted muscles not adherent in the scar. The pathology in these cases results from long periods of immobilization with one group of muscles completely relaxed and the opponents taut. Because of the resiliency of muscle tissue, relaxed muscles rapidly contract while the taut ones extend and become fixed in these lengths to accommodate their maintained positions. For this reason it is important, particularly in Pott's fractures, that the joint be immobilized with the muscle antagonists in a neutral position. If contractures of the calf have occurred in an ankle fracture, exercises and passive stretching are helpful, but again active function is particularly valuable treatment. The heel may be raised by applying $\frac{1}{8}$ to $\frac{1}{4}$ inch layers of leather or balsa wood until the foot can comfortably carry weight. Then as tolerable, following walking, a layer at a time may be removed from the heel until the normal heel height has again been gained.

CONCLUSION

May I again point out to you that there are many uncertainties and that there are many unavoidable, unhappy results in the treatment of fractures. On

the other hand, there are few poor results which cannot be ameliorated or rehabilitated by further definitive treatment. Each poor result will present itself as a specific entity, and your solution of that problem must be based on the answer to an equation. The factors in that equation are a knowledge of the available corrective measures, an evaluation of the extent of the existing disability, and a decision on

whether correction is worth the expenditure of time, money, and pain. You still must meditate with Hamlet, "whether it is nobler to suffer the slings and arrows of outrageous fortune, or to take arms against a sea of troubles and by opposing end them."

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Heart Disease

A Study of Blood Ammonia Levels in Congestive Heart Failure with Report of Three Cases

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Disorientation, delirium, frank psychosis, tremors, and even more complicated pictures of mental and neurological abnormalities have long been noted during and as a terminal event of congestive heart failure. So frequently and for so long have these signs been noted that seldom is an explanation asked for. When the matter is questioned, the traditional interpretation of these central nervous system manifestations utilizes the obvious state of hypoxia to explain the phenomena. Doubtless the diminished oxygen supply to the various organs of the body must result in profound and complex metabolic changes contributing to nervous system changes. In spite of the reasonableness of this exposition, it has been questioned of recent date. The belief that other factors contribute certain features is now more convincing.

For several years we have been impressed by the striking similarity in mental and neurological abnormalities seen in the patient in hepatic coma and the patient suffering severe congestive heart failure. Emotional irritability, confusion, delirium, agitation, flapping tremor, lethargy, and weakness are common to both conditions. Clarification of the pathogenesis of these complicating signs in severe liver failure immediately suggests application of the same explanation in congestive heart failure. Liver dysfunction and abnormalities coexisting in heart failure have been the subject of interest for some time, so the relationship seems less remote.

Both anatomical and functional alterations of the

liver in patients with congestive heart failure have been reviewed by many investigators. Anatomical changes include dilatation of the sinusoids and narrowing of the liver cords in the central area of the lobules, necrosis of the central cells, condensation of reticulum in the degenerated central areas, marked thickening of the walls of the central and hepatic veins, as well as fibrosis of the liver with active fibro-

Blood ammonia levels were determined in 26 patients, and the clinical courses of three are reported. Possible explanations are given for elevated blood ammonia levels, potential hazards of therapy are discussed, and the need for additional investigative studies is stressed.

blastic proliferation. The degree of hepatic necrosis varies with the degree and severity of congestive heart failure. So-called liver function tests are also deviated from the normal. Bromsulfalein excretion is usually impaired. Mild elevation of serum bilirubin is common, but clinical jaundice is rare in the absence of pulmonary infarction. The urine urobilinogen is often elevated. Serum albumin, alkaline phosphatase, thymol turbidity, and cephalin cholesterol flocculation values are usually normal, however.

Innumerable metabolic abnormalities surely exist during any given episode of severe liver failure. The

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complexities of these deviations still largely defy actual measurement. This is to be expected in a situation involving a structure with such broad functions as the liver. Its activity in protein metabolism has recently attracted much interest, chiefly because of the repeated observation that blood ammonia levels are usually quite elevated in liver failure and hepatic coma. Examination of the literature concerning this subject points up the curious fact that although the fundamental knowledge concerning the problem has been known to biochemists and physiologists for many years, clinical application has been attempted only recently.

It has been well established by experimental work that the liver is the principal site for the deamination of ammonia containing compounds absorbed by the intestine. Folin and Dennis¹² demonstrated that the ammonium content of the portal blood was significantly higher than that of the peripheral circulation. More than 30 years ago Matthews¹³ reported that Eck fistula dogs fed a high protein diet developed the syndrome of "meat intoxication." It is now clear that this syndrome has a remarkable similarity to hepatic coma in humans. In fact, comparable demonstrations in humans with portocaval shunts have been made by McDermott and Adams,¹⁴ and Havens and Child.¹⁵ The supposition that high blood ammonia concentrations in the portal vein, resulting from the absorption of nitrogenous substances from the intestinal tract, by-pass the normal urea synthesizing mechanism in the liver is reasonable. It must be further theorized that these high levels of ammonia, now present in the systemic circulation, exert a deleterious effect upon the central nervous system producing the syndrome which we call hepatic coma.

Bessman and Bessman¹⁶ have suggested that high levels of ammonia in the blood result in the increased formation of glutamine from alpha keto glutarate with a decreased amount of the latter compound available in the central nervous system to take part in the Krebs cycle. It should be reemphasized that an elevated blood ammonia level may well be only one of multiple metabolic and biochemical abnormalities occurring in hepatic failure and coma. Whether the mental and neurological changes in this syndrome can be charged directly and specifically to ammonia ion intoxication is to date still unsettled.

Sherlock and others,¹⁷ finding elevated blood ammonia levels in patients with cirrhosis who evidenced good hepatic cellular function, convincingly suggested portal systemic shunting of ammonia rich blood by and around the normally functioning liver cell. The effect upon the central nervous system, they have termed portal systemic encephalopathy. Here the situation is one of circulatory failure, after a fashion, because of abnormal collateral shunting of portal

blood either around or through the liver. In patients with acute severe hepatocellular damage, the explanation must be altered. Here the liver is so severely damaged and parenchymal cell function is at such a low ebb that the liver acts as a "sieve," failing to perform its function of deamination of nitrogenous materials and passing these on into the systemic circulation.

The above mentioned mechanisms may be operating in patients with congestive heart failure. Severe liver damage resulting from congestive heart failure may interfere with the deamination of ammonia containing compounds brought to the liver by the portal vein. Increased pressure in the hepatic veins and sinusoids, as a result of congestive failure, may increase portal vein pressure with a resultant increase in the flow of the ammonia rich portal blood through portocaval collateral vessels such as the gastroesophageal, hemorrhoidal, and superficial abdominal veins. Thus it is seen that in congestive heart failure there are two mechanisms which may result in increased systemic blood ammonia concentrations.

The possibility that patients with congestive heart failure are prone to develop "ammonia intoxication" assumes more than academic interest. Three of the main therapeutic agents used in the treatment of these patients—ammonium chloride, cation exchange resins, and Diamox—have been shown to be precipitating agents in the production of hepatic coma in patients with liver disease. The possibility that these therapeutic agents may actually be more harmful than beneficial in patients with severe passive congestion of the liver due to cardiac failure must be considered.

Elevated blood ammonia levels have already been reported in patients with congestive heart failure. In a series of nine patients Bessman and Evans²¹ found elevated blood ammonia levels in eight. It is the purpose of this report to present our observations of blood ammonia levels in patients with congestive heart failure studied during the past 12 months.

MATERIAL AND METHODS

Fasting blood ammonia concentrations were performed in 26 patients who were hospitalized because of congestive heart failure. There were 15 males and 11 females. Their average age was 56.6 years with a range from 32 to 73 years. Ten patients had arteriosclerotic heart disease, eight had rheumatic heart disease, six had hypertensive heart disease, two had cor pulmonale, two had syphilitic heart disease, and one had kyphoscoliotic heart disease. Three patients had two types of heart disease.

All of the patients in this study had hepatomegaly. The degree of liver enlargement was determined by palpation and percussion. The liver was considered

to be slightly enlarged if the inferior border was detectable up to four centimeters below the right costal margin in the midclavicular line. If the border was four to eight centimeters below the costal margin, the hepatomegaly was classed as moderate. Markedly enlarged livers were those whose lower borders extended over eight centimeters below the right costal margin. Two patients had slightly enlarged livers, 19 had moderately enlarged livers, and five had markedly enlarged livers. Eleven of the 26 patients showed some abnormality of standard liver function tests. None of the patients had dilated abdominal veins, hemorrhoids, esophageal varices, or other evidence of portocaval collateral circulation. Abnormally high venous pressures were recorded in 11 of 13 patients in whom they were performed.

The blood ammonia determination was carried out by a modification of Conway's method.²² Venous blood was introduced into a saturated solution of potassium carbonate in the outer chamber of a Conway dish. The inner chamber containing 0.0002N hydrochloric acid with methyl red methylene blue indicator was titrated with 0.0005N barium hydroxide after diffusion was allowed to proceed at room temperature for 15 minutes. A blank and a standard solution of ammonium sulfate were run simultaneously with the unknown. The details of this determination are reported elsewhere.²³ In all cases, the diffusion process was started within five minutes after the blood was shed. It has been shown that the ammonia content of the blood is stable up to 20 minutes after the blood is shed.²³

In our laboratory normal values for fasting blood ammonia range from 50 to 110 micrograms per 100 milliliters.²³ Abnormal values are those above 135

micrograms per 100 milliliters. Concentrations between 110 and 135 micrograms per 100 milliliters are in a twilight zone and considered neither normal nor abnormal by us. Figure 1 shows the percentile distribution of various blood ammonia concentrations as determined by our laboratory in 100 normal fasting persons.

RESULTS

Table I lists the blood ammonia concentrations of the patients in this series. It will be noted, out of a total of 29 blood ammonia values, 25 were in the normal range, two were in the twilight range (C. B. and A. M.), and two were markedly elevated (L. F. and R. P.). We were unable to obtain any significant correlation between the blood ammonia concentrations and the size of the liver, duration of congestive failure, height of venous pressure, or degree of abnormality of the standard hepatic function tests.

CASE REPORTS

The clinical courses of the two patients in whom abnormally high blood ammonia levels were found are reported below:

Case 1, L. F., a 35-year-old male, was admitted to

TABLE I

Patient	Blood Ammonia (micrograms %)	Central Nervous System Abnormalities
O. F.	59	0
E. C.	77	0
V. T.	75	0
J. V.	62	0
D. C.	77	0
C. B.	62, 110	0
L. F.	176	X
I. M.	70	0
L. F.	71	0
T. V.	91	0
A. M.	111, 89	0
F. H.	84	0
G. H.	92	0
M. J.	62	0
M. K.	92	0
F. M.	69	0
G. F.	71	0
W. N.	82	0
C. K.	82	0
J. B.	77	0
S. H.	82	0
M. L.	92	0
G. H.	67	0
H. W.	62	0
L. N.	107	0
R. P.	164, 81	X

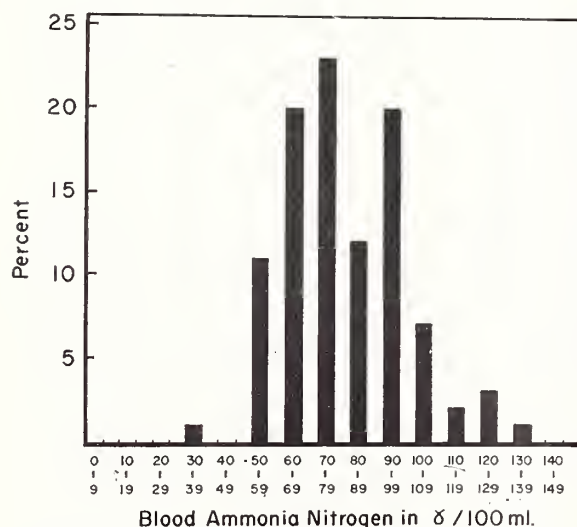


Figure 1. Percentile distribution of various blood ammonia concentrations in 100 normal persons.

the hospital with a diagnosis of subacute bacterial endocarditis due to streptococcus viridans. The patient had had rheumatic fever at the age of 12. He had been asymptomatic until 6 months prior to admission, when he noted fever and fatigue. Three weeks prior to admission he developed signs and symptoms of congestive heart failure.

Physical examination revealed cardiomegaly. Murmurs of mitral stenosis and insufficiency were present. Moist rales were present in both lung bases. The liver was enlarged to 7 cm. below the right costal margin. The spleen was palpable 4 cm. below the left costal margin. Moderate ascites was noted. Two plus sacral, pretibial, and pedal edema was present. Several splinter hemorrhages were noted in the nail beds.

Nonprotein nitrogen was normal. Liver function tests were within normal limits. Blood cultures were positive for streptococcus viridans. Blood ammonia was 62 micrograms per cent.

The patient was digitalized, treated with diuretics, and given eight million units of penicillin daily for six weeks. On this regimen he became afebrile and recompensated. He was discharged on a low salt diet and maintenance gitalin after almost two months of hospitalization.

Seventeen days after being discharged, he was readmitted, acutely ill. For three days prior to this admission the patient had noted lethargy, nausea, vomiting, anorexia, oliguria, and ankle edema.

At this time he was extremely lethargic and apathetic and unable to give a reliable history. No fever was present. The lungs were clear. The cardiac murmurs were unchanged. The liver was enlarged 8 cms. below the right costal margin. Two plus pedal edema was present. Bilateral Babinski signs were noted.

During this hospitalization the blood nonprotein nitrogen rose steadily from 114 to 155 mgm. per cent. The serum sodium ranged from 119 to 132 mEq/L; serum potassium from 7.0 to 7.9 mEq/L., and serum chloride from 89 to 96 mEq/L. Carbon dioxide combining power varied from 8.8 to 15.4 mEq/L. Hepatogram showed a bilirubin of 7.3 mgm. per cent, alkaline phosphatase of 31 millimol units, and cholesterol esters of 11 per cent. Blood cultures were negative. The blood ammonia was 176 micrograms per cent.

The patient was treated with low salt diet, gitalin, and parenteral fluids. Throughout his brief hospitalization, he was restless, confused, drowsy, irritable and hallucinating. During the last 48 hours of his life, he became jaundiced and comatose. He gradually went down hill and died six days after admission to the hospital.

At autopsy the heart weighed 1000 grams. The

mitral valve showed an old rheumatic valvulitis with rupture of many chordae tendineae due to healing verrucae. There was dilatation of the right atrium and right ventricle. The left atrium was markedly dilated and contained a mural thrombus. The lungs showed chronic passive congestion. There were tiny healing infarcts in the spleen and kidneys. The liver weighed 1200 grams and showed central necrosis. Tremendous passive congestion was present. In many places the congestion was of such a degree as to simulate hemorrhage in the liver. The sinusoids and liver parenchymal cells were completely overwhelmed by the amount of erythrocytes present. It was the conclusion of the pathologist that the superimposed subacute bacterial endocarditis, by further damaging the mitral valve, contributed to congestive failure. It was thought that the endocarditis was healed, but unfortunately the vegetations were not cultured.

During the last few days of this patient's life, he showed many of the signs of a patient in liver failure and coma. He had had no liver disease until congestive heart failure developed. It is reasonable to assume that all the anatomical and functional changes in the patient's liver were due to congestive heart failure. During his first hospitalization, the patient was clear mentally and had a normal blood ammonia level. At the time of his demise he had a markedly elevated blood ammonia level and showed mental and neurological abnormalities.

Case 2, R. P., a 59-year-old man, was admitted to the hospital in congestive heart failure of one month's duration, manifested by dyspnea, orthopnea, and edema. He had had diabetes for 15 years. At the time of admission he was taking 60 units of NPH insulin daily, digitalis, and ammonium chloride.

On admission he was disoriented, lethargic, and repetitious in his conversation. History taking was difficult because of the patient's mental status. Coarse moist rales were present in the right lung base. The heart was not enlarged to percussion, but a grade two apical systolic murmur was present. Minimal ascites was noted. The liver edge was palpable 6 cms. below the right costal margin. Two plus pitting edema of the feet and ankles was present. The hepatogram was normal. The electrocardiogram showed an old antero-septal myocardial infarction.

The blood ammonia concentration was 164 micrograms per cent on the day following admission. The patient was placed on a 1700 calorie rice and fruit diet that contained 50 mgm. of sodium a day. He was given 20 units of NPH insulin and 0.15 mgm. of digitoxin daily. His weight dropped from 160 to 139 pounds, and his dyspnea, orthopnea, and edema disappeared. For the first few days in the hospital, his sensorium remained unchanged. Then

it gradually became clearer as his congestive failure was controlled. On the day of his discharge from the hospital, he was mentally alert and fully oriented. A repeat blood ammonia level at that time was 81 micrograms per cent.

This patient showed an abnormally high blood ammonia level associated with mental aberrations and cardiac decompensation with passive congestion of the liver. As he responded to treatment, his liver became smaller, the blood ammonia level returned to normal, and he became mentally alert again. It is interesting to speculate on the role of the ammonia chloride that he received prior to admission in the production of a high blood ammonia level in this patient. Hepatic coma has been produced in patients with liver disease by the administration of ammonia chloride.²⁴

The following case report is not included in our series because it represents a patient who had Laennec's cirrhosis in whom congestive heart failure had developed. However, it is reported in detail because it is illustrative of the mental and neurological changes that may occur when congestive heart failure is superimposed on a previously damaged liver.

Case 3, J. P., a 49-year-old white male, was seen in the outpatient department complaining of shortness of breath. For two years he had noted dyspnea which had become progressively worse in the preceding two months. He gave a history of pedal edema of five months duration and abdominal swelling of two months duration with a weight gain of 50 pounds during the latter period. He had been in good health prior to his present illness but had consumed several pints of whiskey weekly for 15 years previously.

Physical examination revealed a well developed, obese (287 pounds), white male in moderate respiratory distress with generalized anasarca. Blood pressure was 150/90, pulse 92, and respirations 32. Generalized high pitched musical rales were heard throughout the chest with moist rales in both bases. Cardiac dullness could not be percussed accurately. Heart tones were distant. No murmurs were heard. The abdomen was protuberant, and a fluid wave was present. The liver was enlarged 8 centimeters below the right costal margin, was nontender and finely nodular. There was marked pitting edema of the lower extremities up to the level of the second lumbar vertebra.

A diagnosis of Laennec's cirrhosis was made, and the patient was admitted to the hospital for further treatment. On admission nonprotein nitrogen and serum electrolytes were within normal limits. Hepatogram revealed the following values: Total bilirubin 1.5 mgm. per cent, alkaline phosphatase 2.4 millimol

units, thymol turbidity 13 units, cephalin cholesterol flocculation 2+ in 48 hours, total cholesterol 242 mgm. per cent with 41 per cent esters, prothrombin concentration 75 per cent. Blood ammonia concentrations on the second and third hospital days were 147 and 170 micrograms per cent respectively. The electrocardiogram showed sinus tachycardia, left axis deviation, and abnormal T waves. A chest x-ray showed the heart size as at the upper limits of normal.

The patient was treated with bed rest, low salt diet, digitoxin, and aminophylline. On the tenth hospital day he became lethargic and developed increasing dyspnea and cyanosis. A chest x-ray at this time showed pulmonary congestion and cardiomegaly. Paracentesis was performed with some relief of symptoms.

On the 14th day the patient began hallucinating and became disoriented and confused. It was felt that he was in the precoma stage of hepatic coma. However, a blood ammonia level at this time was 120 micrograms per cent. He was started on cortisone in a dosage of 75 mgm. a day. Mental confusion continued intermittently.

On the 22nd day the patient developed dyspnea and deep cyanosis. His confusion and delirium increased. It then became apparent that the degree of heart failure had been grossly underestimated. Death was expected momentarily. Paracentesis and phlebotomy were performed as emergency measures. Dyspnea and cyanosis improved, but the patient developed typical hepatic coma which lasted three days. During this period blood ammonia levels were 211, 150, and 231 micrograms per cent. In an effort to alleviate the coma, a total of 69 grams of monosodium glutamate was given intravenously over a three-day period.

By the 27th day his sensorium had cleared, his weight had dropped to 220 pounds, and he was able to be up and around. Chest x-ray at that time revealed that the transverse diameter of the cardiac silhouette had decreased by two and one-half centimeters. From that time on the patient steadily improved and responded well to diuretics. Liver biopsy was done on the 52nd day and demonstrated diffuse hepatic fibrosis and fatty metamorphosis. He was discharged on the 53rd day on a low salt diet and a maintenance dose of digitoxin. At the time of discharge he had no edema and only a trace of ascites. However, his liver was still enlarged eight centimeters below the right costal margin. The blood ammonia level was 159 micrograms per cent at this time. Seen in the outpatient department two months later, the patient weighed 200 pounds and had no edema or ascites.

This patient illustrates some of the profound metabolic changes that may occur in a patient with a damaged liver who develops congestive heart failure.

These changes, reflected in mental and neurological abnormalities and elevation of the blood ammonia concentration, were successfully handled only by vigorous treatment of the heart failure simultaneously with efforts to relieve portal systemic encephalopathy. Here a combination of systemic diseases—hypertensive cardiovascular disease and Laennec's cirrhosis—found in the same patient serves to illustrate and bridge the discussion from the first two cases of primary heart disease and the third case of primary liver disease.

DISCUSSION

In view of the autopsy findings, it seems obvious that the cause of death in the first case was severe congestive heart failure. The severe degree of congestion of the liver was sufficient to result in a marked degree of jaundice as well as to cause abnormalities in the standard liver function tests. The abnormally high blood ammonia demonstrated in this patient can best be explained by the severe degree of hepatic damage. It is postulated that some of the high ammonia containing portal vein blood was shunted around the liver and directly into the systemic circulation as a result of the tremendously increased intrahepatic pressure.

In addition, the surviving hepatic cells were probably unable to synthesize urea from ammonia because of damage to them as a result of high intravascular pressure and hypoxia within the liver. We are unable to satisfactorily explain the azotemia in the patient. Possibly it may have been the result of renal dysfunction, secondary to severe chronic passive congestion and hypoxia.

The second case illustrates a correlation between congestive heart failure, elevated blood ammonia level, and mental aberrations. Again we wish to emphasize that an elevated blood ammonia level is only one metabolic abnormality in a complex picture. Any attempt to explain the mental or neurological picture of hepatic coma on the basis of an elevated blood ammonia alone is a gross oversimplification. Numerous other metabolic abnormalities are undoubtedly present.

The third patient showed an elevated blood ammonia level associated with mental and neurological changes. Two factors seem to be instrumental in the production of this picture. It is postulated that this patient already had a severely damaged liver due to cirrhosis. When he developed congestive heart failure, further damage was inflicted on the already malfunctioning liver, and consequently the blood ammonia concentration increased and the patient developed typical hepatic coma. Only prompt energetic treatment of the congestive failure kept this patient from dying in hepatic coma. Just how great

a part each factor played in the production of hepatic coma in this patient can only be surmised. The role of monosodium glutamate in this patient's rapid recovery is unknown. Theoretically, sodium glutamate is supposed to lower the blood ammonia level by combining with ammonia to form glutamine and thus free more alpha keto glutarate to take part in the Krebs cycle in the central nervous system.

Since it has been shown repeatedly that the administration of Diamox, ammonium chloride, and cation exchange resins in hepatic disease may cause an elevation of the blood ammonia level, it becomes obvious that these therapeutic agents may be contraindicated in severe chronic passive congestion of the liver. It seems apparent from clinical studies that an elevation of the blood ammonia is associated with definite neurological and mental signs and symptoms.

It is apparent from the results of this study that a great many patients with congestive heart failure and chronic passive congestion of the liver have normal blood ammonia levels. Since Diamox, ammonium chloride, and cation exchange resins have been used repeatedly in the routine treatment of congestive failure without detrimental effects, it seems reasonable to assume that in the average case they are relatively innocuous. However, if a patient in congestive failure shows a severe degree of hepatic congestion and/or mental or neurological aberrations, the administration of any of these agents which are known to be able to precipitate hepatic coma is contraindicated. In brief, it is to be emphasized that the indiscriminate use of ammonium chloride, Diamox, and cation exchange resins in congestive heart failure is to be condemned. While the use of these agents is beneficial in most patients, it may well be detrimental in some.

Additional studies of blood ammonia levels in patients with congestive heart failure before and after the administration of Diamox, ammonium chloride, and cation exchange resins are contemplated. The use of the ammonium chloride tolerance test as described by White and others²⁴ in patients with liver disease would be of interest in this group of patients. The role of antibiotics in lowering an abnormally high blood ammonia, by decreasing the amount of amine forming bacterial flora in the intestinal tract, needs to be evaluated. The part played by electrolyte imbalance in congestive heart failure in relation to mental and neurological changes requires further investigation.

SUMMARY

1. Blood ammonia levels were determined in 26 patients with congestive heart failure and hepatomegaly. A total of 29 determinations were performed,

of which 25 were normal, two borderline, and two markedly elevated.

2. The clinical courses of three patients with elevated blood ammonia levels are reported. These patients exhibited mental and neurological abnormalities similar to those found in patients in hepatic coma. To further the correlation, one case report deals with a patient who had Laennec's cirrhosis and subsequently developed congestive heart failure and hepatic coma.

3. Possible explanations for elevated blood ammonia levels in congestive heart failure are discussed.

4. The potential hazards involved in the use of Diamox, ammonium chloride, and cation exchange resins in patients with congestive heart failure and hepatic damage are emphasized.

5. The need for additional investigative studies in this field is brought out.

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Every day increases the sheer weight of knowledge put into our hands, some new power control over natural processes. . . . Our age is being forcibly reminded that knowledge is no substitute for wisdom. Far and away the most important thing in human life is living it.

—*Rt. Rev. F. R. Barry*

Biopsy

Panel Discussion on Its Role in the Spread of Cancer

Moderator: DAVID W. ROBINSON, M.D.,
Kansas City

Participants: ARTHUR DeBOER, M.D., *Chicago*

WILLIAM T. FITTS, JR., M.D.,
Philadelphia

VICTOR F. MARSHALL, M.D.,
New York

JOHN R. McDONALD, M.D.,
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JOHN R. PAINE, M.D., *Buffalo*

Dr. Robinson: Our conference committee thought that we might profitably discuss in this day devoted chiefly to cancer some of the indications for biopsies in various parts of the body and some of the definite contraindications wherein a biopsy might cause more harm to the patient than had the biopsy not been done. I am sure you will all agree that the first stated objective is the correct one. When in doubt, a biopsy to establish what is wrong, so that we can decide what to do, should be our chief conclusion.

The first question to come up before our panel is whether biopsies can make some difficulties for us. Because of the experience I have had with some of these, I would like to ask the opinion of some of the gentlemen here what their experience has been. First, and the most difficulty I have had about doing biopsies, at times, relates to melanomas. I would like to start by asking Dr. McDonald if he'd say a word of what he thinks about biopsies of melanomas. Can we ever get in trouble by biopsying, let's say, a lymph node that has melanoma in it and that might make future troubles for us?

Dr. McDonald: I do not know about the potential danger of biopsy of a lymph node containing a melanoma. However, melanotic lesions of the skin should not be treated by cautery without biopsy, as is occasionally done. Under such circumstances it is not unusual for melanotic lesions to be thrown away without histologic study, only to have a metastatic tumor appear subsequently in a lymph node. I believe that biopsy of a melanotic lesion in the skin usually should include excision of the lesion. Incisional biopsy of such tumors should be avoided if possible.

Dr. Robinson: I think that's a significant point. Dr. DeBoer, how wide do you think excisional biopsy should be with a suspected melanoma? What has been your practice?

Dr. DeBoer: That follows the line of the discussion this morning. I exposed my conservatism then, so I'll reaffirm it just a bit. The pigmented lesions that we see in children, of course, are the things that we have in mind. The first question is, "Is this a junctional cell nevus which later on may prove to be malignant or at least take on malignant aspects?" We excise all those; we excise very conservatively in the respect that we make sure that we have a rim of normal tissue that you can see with the naked eye and not have the pathologist only hope that he can find some normal skin microscopically—you can see normal skin around

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the entire border of the pigmented lesion. Then, the incision is carried down through the subcutaneous fat, but the underlying fascia is not excised. These are the usual excisional biopsies that we do on all the pigmented lesions in children.

Dr. Robinson: Does the age of the child make any difference in your consideration of these nevi?

Dr. DeBoer: We used to feel rather sure that if we got the child before puberty we didn't have to worry. We have changed our minds recently. We like to have the pigmented lesions excised at four, five, and six years rather than waiting until they are nine, ten, and eleven years because of the variation in the physiology of puberty in various children.

Again, if it were a suspicious looking lesion on the palm or the sole of the foot, which we know are

not particularly fortunate places to have one, and if the child were 11 or 12 years of age, yes, I would excise that a little bit more widely than I would on a two-year-old baby with a pigmented lesion on its abdomen, for example.

Dr. Robinson: Now we bring up this subject because we have seen an instance or two wherein regional nodes have become enlarged. We have no antecedent history of the removal of a mole obtainable; or, if we have a history of removal, we do not know whether or not it was malignant. Maybe it's been thrown away, which I urge you never to do. And this node is enlarged in the neck or in some other regional lymph node area following the removal of a nevus. We have seen where a needle has been inserted into a node to try to get a needle biopsy to determine what might be the cause of the lymphadenopathy. I'd like to show the first slide on melanoma. Dr. Boley obtained this slide for us from his friend down at Columbia, Missouri, Dr. Richard Johnson.

Dr. Boley: You can see the needle track in the tissues. It goes down and has punctured the node. Under higher magnification you will find that in each one of these fascial planes there is melanoma growing out in either direction and along the track so that, if one decides to do this sort of procedure, he has to be willing to proceed farther and remove those needle tracks. If you come from several directions toward the node in doing the needle biopsy, you will sacrifice as much skin as with the definitive operation contemplated.

Dr. Robinson: Thank you, Dr. Boley. Needle biopsies are done frequently in some institutions. Here's one instance where I think one can say that there's been trouble from a needle biopsy, and I would like to ask these gentlemen how they feel about needle biopsies for informational purposes in general. Dr. McDonald, do you employ this very much in your institution?

Dr. McDonald: The surgeons at my institution use needle biopsy for very specific indications. They would not use this procedure in a situation such as the one just described because they believe that one should be able to excise the sinus tract whenever needle biopsy is used if the lesion proves to be malignant, because implantation along sinus tracts can occur. Needle biopsy is of greatest value in situations such as that of the patient who has a lesion that is obviously malignant and not removable. I think it may be used best in a situation when such a procedure might save the patient undergoing anesthesia and an operation, with a fairly long stay in the hospital. Needle biopsy of the liver is of particular diagnostic value. Thus, I would not condemn needle biopsy as of no value, but I certainly agree with what

Dr. Boley has said and Dr. Robinson has advised. Needle biopsy should be used with some care.

Another factor is that the average pathologist may not know how to interpret material obtained by needle biopsy. He is handicapped if he is not experienced with this procedure. Needle biopsy may be done by several methods. One way is to macerate the material on a slide and make a smear; this is the technic used at Memorial Hospital. In other places, a bore of tissue is taken, which is the procedure that my associates and I have used.

Needle biopsy may be of great importance in making a diagnosis of deep-seated pancreatic lesions. With the abdomen open, one may do a needle biopsy of the pancreas because it is sometimes impossible to excise tissue containing malignant cells in carcinoma of the pancreas. Approximately 15 per cent of gross diagnoses of pancreatic carcinoma based on firmness of the involved tissue are erroneous. Thus, before a radical operation is done on the head of the pancreas for carcinoma, it is essential to have a histologic diagnosis. Needle biopsy from deep in the pancreas and study of the tissue so obtained by rapid frozen section will answer this problem and be of considerable help to the surgeon.

Dr. Robinson: Dr. Paine, do you employ needle biopsies very much in your institution or does your staff?

Dr. Paine: In my institution needle biopsies are almost entirely confined to the medical wards. The internists do them but the surgeons rarely. Dr. McDonald has touched on the point that has disturbed me most about needle biopsies, or rather the thing about biopsies that has bothered me most, and that has to do with the business of pancreatic lesions. I can see where he well may be right in advocating the use of needle biopsies in the head of the pancreas. On the other hand, there's another phase to this problem, and that is to utilize the needle biopsy for its best value. You've got to have the cooperation of the pathology department. Now Dr. McDonald is a very cooperative pathologist. He's almost a surgeon, but he hasn't got a knife. You can find many pathologists who will discourage you from using needle biopsies, and they will go to great lengths to tell you that they're valueless. Well, who am I to say that they aren't telling me the absolute truth? We have been discouraged somewhat about attempting to use needle biopsies.

Then there's another point that hasn't been brought up yet, I think, and that is that the positive evidence that you may get from a needle biopsy is very valuable, but the negative evidence doesn't mean so much. In other words, can we always be positive that we're getting this tissue from the place we would like to

have it? What do you think about that, Dr. McDonald?

Dr. McDonald: I agree wholeheartedly, Dr. Paine, that negative results of biopsy are not of much diagnostic value.

Dr. Robinson: Don't you think there needs to be some education amongst you pathologists about the proper utilization of this method?

Dr. McDonald: I think so. As already indicated, some pathologists have not been trained in the method. It is probably not wise to force a pathologist to use a technique with which he is unfamiliar.

Dr. Robinson: That, then, will narrow the possibilities of utilizing any procedure really to the capabilities of one's own staff. When you have a pathology department that refuses to make a diagnosis on a needle biopsy, I think you'll just have to give it up. Dr. Marshall, you have use for needle biopsy, don't you, in your field of endeavor at times?

Dr. Marshall: We have some use for it. While these gentlemen were talking there came to my mind a specific example about the lack of *exclusive* value that an aspiration biopsy has. Consider the circumstance of an apparently operable prostatic carcinoma. If one aspirates a lump in the prostate and demonstrates carcinoma, he operates because it's carcinoma (conditions permitting, of course). If he aspirates it and doesn't get carcinoma, he operates to see why he didn't get carcinoma.

I think that's an entirely different matter, however, from the patient who already has metastases and a big hard prostate. This prostate is much easier to aspirate successfully, and the surgeon can have perfectly concrete evidence of carcinoma of the prostate before the patient is deprived of his orchids. It is possible, however, to implant carcinoma along the aspiration line; but considering the diffuseness of the disease already, this consideration does not assume much practical significance.

I would like to add one other thing, if I might, about this business of the pathologist. When I first went to Memorial Hospital, I didn't think the pathologist's reports from aspiration meant much, but I changed my mind drastically. It is actually quite valuable as long as you know that a positive report nearly always means cancer, but a negative report is of little value to indicate that cancer is absent. Many aspirations are done at Memorial, so their pathologists not only have much interest and large experience, but also constant practice. It makes a lot of difference who the pathologist is.

Dr. Robinson: That brings us to a point which may be heresy to say before a pathologist. But I think they will agree also with us that there are times wherein may be they've erred a bit. When one goes too positively on the histological diagnosis as against

his clinical judgment, I'm sure he's going to cause some havoc at times if the clinical judgment is good. If it's bad, of course most anything might happen.

I had a patient we worried about quite a lot. He had a large golfball size mass in his left tonsil and a big mass in his neck. We had the tonsil removed, and we took out a node in the neck, thinking this was a lymphoma. All we could come up with was hypertrophy of lymph node, and that's all. But clinically it was lymphoma. So the patient was treated, properly, with radiation after about the third biopsy, which still looked like hypertrophied lymph node. The lymphatic tissue completely regressed. At least it has for a couple of years, and what comes later we don't know. But there are instances, I am sure, wherein we can be misled by the biopsies. Would you agree with that, Dr. McDonald?

Dr. McDonald: Yes, I agree. I should like to make one other point if I may. It is a well known fact that an inexperienced resident may be able to obtain positive results in 60 per cent of carcinomas of the breast by means of needle biopsy. As he becomes better and more adept at the procedure, it is possible to obtain positive results in 80 per cent of such cases. Perhaps part of the reason for a high incidence of negative results is that the problem of aspiration biopsy may be turned over to the greenest man on the staff.

Dr. Marshall: Sometimes we "ripe" surgeons are not so good ourselves! I've tried to aspirate many little lumps in the prostate without success; and then explore, take the regular biopsy, and find out that it is carcinoma. That's one reason why I don't frequently put needles in the prostate. But it's amazing how adept some persons can get at hitting things with a needle. Simple practice makes for much improvement. And it's amazing that they get into so little trouble.

Somebody mentioned aspirating the liver here a minute ago. I saw an example of a liver aspiration in which two holes were also made in the gallbladder!

Dr. Robinson: Dr. McDonald mentioned a moment ago about carcinoma of the breast, and herein I think our treatment is directed definitely according to what biopsy findings are at times. Dr. Fitts, have you some thoughts about biopsy of the breast and how it directs your treatment?

Dr. Fitts: We almost routinely do biopsy of the breast, Dr. Robinson, and in our hospital at the University of Pennsylvania almost never do aspiration biopsies of breast lumps. When I was a resident, a woman was presented at a tumor conference who had an extensive lesion in the breast with all the classical signs of cancer. The two men with the most experience with breast cancer at our hospital said, "It's ridiculous to biopsy this breast. Go right ahead

with a radical mastectomy." I went ahead with radical mastectomy, and pathological examination showed only extensive chronic cystic mastitis with inflammation. This experience has stayed with me. I feel that, although I'm sure I'm right in most instances of very definite cancer, I ought to make a completely definite diagnosis. I believe it would be almost impossible to prove clinically that a biopsy of a breast lesion has worsened the prognosis to any extent. We are fortunate in most breast lesions that we can tell the diagnosis at the time of the operation and go ahead with the proper operation. In my experience, in all but about 2 or 3 per cent of breast lesions, a gross and frozen section diagnosis at the time of operation has been definite and correct and we have gone ahead with radical mastectomy if cancer were present.

On the other hand, if there is reason to doubt that the lesion is malignant, we do not believe that waiting until a paraffin section is available, 36 hours or two days, really materially alters the prognosis, and we think it's valuable to wait. In our experience it's been especially the peripheral papillary type of lesion in the breast that has been hard to tell by a frozen section examination.

Dr. Robinson: What precaution do you take in doing a biopsy of the breast and then proceeding with a mastectomy not to seed the field?

Dr. Fitts: There's no question, Dr. Robinson. It's been shown many times that the instruments used for biopsy may transmit viable tumor cells; all instruments used for biopsy should be discarded and the wound completely draped before radical mastectomy is begun.

Dr. Paine: Excuse me. Do you close the wound or pack it?

Dr. Fitts: We close it, but I sew a piece of gauze over the wound so that no blood will seep out of the wound following biopsy. In small lesions we almost routinely do an excision of a breast lesion. In large lesions we may do an incision biopsy.

Dr. Robinson: Dr. Paine, it seems to me that the thyroid is a site which lends itself at times to considerable discussion as to what to do about a nodule in the gland. Certainly you have to explore it. We're all agreed about that. What is your procedure in investigating a nodule in the thyroid, and how do you go about it?

Dr. Paine: If a patient is being operated upon, we take out the nodule, and I can't conceive of our sticking a needle in it before operating on it, although that might be the proper thing. We wouldn't. We would remove the nodule surgically and then I think we'd be arguing in some instances for the next two weeks whether it was cancer or not. That's not true in every case, of course. But I would feel that wherever possible a lesion in question should be excised rather than incised or have a needle stuck

in it, and I would try to follow that general principle in dealing with thyroid nodules.

Dr. Marshall: Dr. Paine, if a nodule in the thyroid involves a good part of the lobe, would you go ahead with a clean thyroidectomy, removal of the isthmus, at that time so that, let's say, if this were malignant, it wouldn't need a secondary operation? Or would you feel that you need more if this were malignant?

Dr. Paine: I would probably trust my surgical judgment and in some instances would probably proceed with a hemithyroidectomy and hope I'd be borne out later on by the pathological study. I can conceive, though, of instances where I might do either. I think that's a very difficult field in which to make a dogmatic statement.

Dr. Robinson: Isn't it true, gentlemen, and I'd like Dr. McDonald especially to answer this, that some metastasizing carcinomas of the thyroid look quite histologically benign? In bones or lungs they look just as benign as can be. Isn't that right, Dr. McDonald?

Dr. McDonald: Yes, that's right, Dr. Robinson. Dr. Paine has brought up an extremely interesting question. A pathologist who does many frozen sections becomes adept at them, but a small number of thyroidal cancers still exist, particularly the solid type of thyroidal cancer, that give diagnostic difficulties when studied by means of fresh frozen sections. Occasionally a final opinion cannot be given without study of fixed sections.

Dr. Robinson: Isn't it better to take out those nodules?

Dr. McDonald: I think so.

Dr. Robinson: In toto?

Dr. McDonald: Yes, in toto. What's more, most nodules that are questionably malignant on fresh frozen section are found to be carcinomas in the final analysis. Of course it is relatively easy to diagnose the papillary group of lesions by means of fresh frozen sections. I believe that rapid frozen-section diagnosis of thyroidal malignant lesions is of value as a guide to further surgical procedures.

Dr. Robinson: Then the positive evidence that you can get at the table is very valuable, but negative evidence isn't?

Dr. McDonald: No, it is not.

Dr. Robinson: We are always faced with that in so many fields of surgery. Now, there are other instances in which tissue looks histologically benign, but actually it's clinically malignant and it has infiltrative characteristics. Is this not true, Dr. McDonald?

Dr. McDonald: Oh, yes.

Dr. Robinson: For instance, carcinoma of the mouth.

Dr. McDonald: The histologic diagnosis of squamous cell carcinoma of the floor of the mouth may

be extremely difficult. In particular, it is difficult to differentiate papillary squamous cell carcinoma of the floor of the mouth from benign papillary hyperplasia. Most of these lesions are malignant clinically and yet they look benign microscopically. Another region that poses problems is the prostate. Slowly growing, gland-forming cancers of the prostate raise difficult diagnostic problems for the pathologist. Tissue obtained from the prostate by perineal biopsy should be diagnosed without delay because it is best for the surgeon to proceed with definitive surgical therapy immediately rather than to reopen the operative field later.

Dr. Marshall: Yes, I think that's true. What Dr. McDonald said has a lot to do with the reported cure rates in carcinoma of the prostate too. What some people call carcinoma of the prostate is not what some other people agree to.

Dr. Robinson: Well, now, to change the field of endeavor a little bit. Dr. DeBoer, what about the large tumors in the flank of children? Is it necessary to biopsy them to make a diagnosis?

Dr. DeBoer: I presume you're referring to the Wilm's tumor or neuroblastoma in general. No, about the only time we are concerned about the diagnosis is in an invasive type of tumor and we're wondering whether or not it is of the lower grade malignancy, such as was intimated in the neuroblastoma. We may ask the pathologist to further identify it. Say, for example, the tumor is invasive into the chest wall or posterior peritoneal wall. If it's a sarcomatous lesion, I think it's hopeless if it's invaded into the area of the inferior vena cava and the aorta. Whereas, if it's a neuroblastoma, we feel very encouraged in spending another hour and trying to get practically all the tumor out. Even though all of the tumor is not removed, we feel we get considerably better results if we get most of the tumor out followed by x-rays. Whereas, if it's a sarcoma, I think it would be rather ridiculous to risk sacrificing the youngster's life with a tumor that is already far beyond the limits of surgical excision.

Dr. Robinson: Then you proceed with exploration without knowing the exact site in this instance?

Dr. DeBoer: If it's a tumor that we find, for example, on the posterior peritoneal wall that has invaded, and we feel it's going to be exceedingly difficult to remove, we may very well take a specimen of the tumor and send it over to the pathologist. If he can tell, for example, that it is a sarcoma, I think we would be less energetic in trying to get it because it has already invaded so far that surgical excision would probably not be feasible. In the more benign type of tumors, such as the neuroblastomas, we would be more energetic in removing them.

Dr. Robinson: Let's change the subject once more. Here's one that strikes me right in the middle

of my solar plexus at certain times. That is what to do about the parotid tumor. The pathologist may not be able to help me, and I may not be able to tell, and I sweat away for two hours to avoid having some old guy going around afterward with his face all drooping down and have him say, "Well, I'm Dr. Robinson's patient. Look what he did to me." Yet, of course, if it's carcinoma, we should be just as radical as possible because these are very malignant tumors at times, and they could do away with the patient. Certainly there is a high recurrence rate. And yet we know that if we break the capsule of the parotid and even though it's only a mixed tumor, there's a good chance that we'll seed some area that may lie dormant for two or three years and then come back. Dr. McDonald, do you have any thoughts on biopsy of parotids in the management of a tumor?

Dr. McDonald: The best way to handle parotid tumors is to take material for biopsy and make fresh frozen sections immediately. It is possible for the pathologist to arrive at the correct diagnosis in almost every instance. For instance, it is relatively easy to recognize cylindromas if one has seen a few of them. Mixed tumors, of course, comprise 70 per cent of tumors of the parotid and usually can be recognized with certainty. All one is interested in at the operating table is whether the lesion is benign, which usually means that it is a mixed tumor, or whether it is malignant. The particular type of malignancy is not necessarily important at that time because treatment should be decided, if possible, right then and there. The parotid gland is one of the regions of the body in which the employment of fresh frozen sections is of greatest value.

Dr. Robinson: How about lymph nodes for fresh frozen sections?

Dr. McDonald: The accurate histologic diagnosis of lymphoma in fresh frozen sections is extremely difficult. However, other diseases of lymph nodes can be recognized with relative ease. For instance, it is easy to diagnose Boeck's sarcoid and carcinoma in fresh frozen sections of lymph nodes.

Dr. Robinson: Of course for the most part it doesn't affect the treatment very greatly anyway, does it? But some of these others do affect the treatment. Now we run into instances where carcinoma has been incarcerated in scar tissue, or irradiated tissue, for quite a long period of time, maybe in cervical nodes or about the face, and we're rather wary here of doing a biopsy at times because we've seen instances in which the tumor, having had its growth and energy held back for a long time, gets loose and goes like wildfire. Have any of you gentlemen had experience with this type of thing in the neck?

Dr. DeBoer: We have. Where they've been heavily radiated, they will just get loose after a biopsy and go wild. We're afraid to do them.

Dr. Paine: Don't you think they do it without biopsying sometimes?

Dr. Robinson: Oh, yes, certainly they can.

Dr. Paine: Are you sure that biopsy causes it?

Dr. Robinson: No, we're not positive. It just follows and certain cause and effect seem to be present.

Dr. Robinson: We don't want to prolong this too long. There may be questions from you that you'd like to propound to these gentlemen. I have one here before me written out. What is the incidence of ovarian involvement with carcinoma of the breast? Will you answer that, Dr. Fitts?

Dr. Fitts: In an autopsy series that we've just gone over—a consecutive series of patients who have died of metastases from carcinoma of the breast—we found the ovaries involved in almost 20 per cent. The thing that has interested us in a group in whom we have done prophylactic oophorectomies is that we found a number of ovaries containing metastases not suspected before operation. I think we found actually about 10 or 15 per cent. In some the metastasis was not recognized until the ovary was sectioned.

Dr. Robinson: Dr. Fitts, if it's true that 20 per cent of autopsy cases have involvement of the ovaries, then isn't it almost a necessity to do a bilateral oophorectomy in every patient with carcinoma of the breast?

Dr. Fitts: We believe it is if distant metastases are present.

Dr. Robinson: Do you know of any other series anywhere near that high?

Dr. McDonald: Were the ovaries you studied obtained from patients who had generalized metastasis?

Dr. Fitts: First, we went over all the patients who had autopsies who had died of carcinoma of the breast. I have forgotten the exact percentages of metastases to the ovaries, but I think it was almost 20 per cent. One would expect a high percentage because these patients died with widely disseminated disease. These were autopsy cases. But we were interested especially in four or five patients in whom at prophylactic oophorectomy (with no evidence of distant metastases), we found small foci of carcinoma in the ovaries on section. This finding may not hold up in a larger series.

Dr. Robinson: Now the other half of this question, Dr. Fitts, is: When the ovary is involved, does it affect the prognosis?

Dr. Fitts: I can't answer that. We wondered about it. People talk about spontaneous regression of tumors. We wondered if possibly some of the reported cases of spontaneous regression of breast carcinoma might not be due to destruction of the ovary by metastases.

Dr. Robinson: I remember Danely Slaughter discussed a patient of his who had had extensive adrenal

metastases with replacement of adrenal tissue by carcinoma from the breast and who was in a state of remission for a long period of time.

Dr. Fitts: We also wondered if some of these spontaneous cancer remissions might not be due to metastases to endocrine glands.

Dr. Robinson: Another question. Some of the surgical literature recommends in parotid tumors to split the gland and save the seventh nerve. In view of Dr. McDonald's statement about cylindromas metastasizing along the lymph channels, by the nerve, would he recommend saving the seventh nerve in this instance?

Dr. McDonald: I believe that total parotidectomy with sacrifice of the seventh cranial nerve is necessary to cure a cylindroma of the parotid gland.

Dr. Robinson: And hasn't it also been your experience that some of these are real sleepers, that nothing happens for a while, and then all of a sudden something does happen in three or four years?

Dr. McDonald: Yes, an amazing number of people who have been treated surgically for cylindroma have remained free of symptoms for five years, and yet they are not cured. We just do not cure them.

Dr. Robinson: I recently had one of the submaxillary gland that went 12 years, and then had bad troubles with generalized metastases.

The next question asked here: Dr. McDonald, there is a small clinic in Ohio which has reported a spread of cancer up the inferior mesenteric vein when cancer of the rectum or sigmoid is manipulated. Could this happen from a rectal biopsy for carcinoma?

Dr. McDonald: That small clinic isn't so small; it happens to be the Cleveland Clinic. Malignant cells were found in the blood in some cases in which venous blood was centrifuged and subjected to cytologic studies. Manipulation presumably forced the malignant cells into the venous channels.

Dr. Robinson: The next question: Would you ever biopsy through a lesion on an extremity which was suspiciously brown-black? Who would like to answer that?

Dr. Fitts: The answer to that is "No," in my opinion. I think it should be excised with a wide margin of normal skin.

Dr. Robinson: Now suppose it was a large lesion that was suspicious and one had a coverage problem afterward. I suppose then you'd take it off anyway and cover it the best you could, cutting it widely around the side.

Dr. Fitts: I think so. You have had more experience with this problem than I.

Dr. Robinson: Well, that's the way we'd manage it. And yet, if it's going to affect treatment (and I think this is true of biopsy in general, to have the prior knowledge), I wouldn't feel remiss to take a

small section at the edge and find out what it is. It could make a great difference in the type of treatment thereafter.

Dr. Fitts: The lesion suspicious of being a malignant melanoma would worry you more than any other type, would it not?

Dr. Robinson: Yes, that's true. The other part of this question is: How would you biopsy the above case with a large axillary mass and with a suspicious lesion on the fifth finger? How would you biopsy this same lesion if you had a large mass in the axilla, the lesion being primary on the finger?

Dr. Fitts: I think you'd want to know what the primary lesion was. I would biopsy the finger lesion. That's one of those instances where you'd want positive information.

Dr. Robinson: There is one other question which I think Dr. Marshall could answer and we'll terminate our discussion. Do you, Dr. Marshall, do punch or transurethral biopsies of the prostate for nodular prostate?

Dr. Marshall: It all depends on whether I think a man is curable by a radical prostatectomy. If he is curable by a radical prostatectomy and operation is feasible, then I suppose the thing to do is expose the area (I prefer the perineal approach), take out the lump, do a frozen section, and proceed. If he is not operable that way, then I would probably do it transurethrally.

Dr. Robinson: Thank you very much. And we thank the members of our panel for this very pleasant session.

Cardiovascular Laboratory

Report of Activities at University of Kansas Medical Center, May, 1953, to May, 1955.

E. GREY DIMOND, M.D., *Kansas City*

A report from this unit was published in the JOURNAL OF THE KANSAS MEDICAL SOCIETY in November, 1953. In that report the activities of the first two years of operation of the Cardiovascular Laboratory at the University of Kansas Medical Center were described. This present report summarizes the second two years, from May, 1953 to May, 1955.

This review is divided into six sections:

- I. Personnel, Residents, Fellows, and Visiting Professors.
- II. Clinics, Consultations and Hospital Services.
- III. Publications, Exhibits, Postgraduate Courses and Research.
- IV. Diagnostic Procedures.
- V. Surgical Procedures.
- VI. Grants.

I. PERSONNEL, RESIDENTS, FELLOWS, VISITING PROFESSORS AND VISITORS

A. Personnel: The clinical staff of the laboratory has continued to be Dr. T. K. Lin and Dr. E. Grey Dimond.

Dr. Kurt R. Reissmann has continued his work as chief of the Experimental Medicine Section.

Dr. Dimond is professor and chairman of the Department of Medicine and director of the Cardiovascular Laboratory.

Two additional staff physicians have joined the group. Dr. Santiago Grisolia activated the Enzyme Chemistry Unit in April, 1954, and Dr. George Curran transferred his work on cholesterol metabolism to the campus in August, 1954. These two men, each an Established Investigator of the American Heart Association, have been major additions. They, with Dr. Kurt Reissmann, have the responsibility for the major basic research activities of the laboratory.

Other physicians, while not members of the cardiovascular laboratories, have had major roles in cardiovascular work at the Medical Center. Dr. Robert Jordan of the Department of Medicine has directed the peripheral vascular studies. Dr. Frank Allbritten, Dr. Creighton Hardin, and Dr. C. Frederick Kittle, of the Department of Surgery, have been cardiovascular surgeons. Dr. Antoni M. Diehl, of the Department of Pediatrics, has seen a considerable share of the pediatric heart work. These men have, in addition, carried on their own investigative programs.

The second two years of operation of the Cardiovascular Laboratory at the University of Kansas Medical Center ended in May of this year. This report summarizes activities of that unit.

The secretarial staff, responsible for the administration of the laboratory, has been Miss Kathryn Calderwood, executive secretary, and Mrs. Eleanor Lane.

B. *Residents*: Several physicians have received training in the field of cardiovascular diseases during this two-year period. The residents in medicine have continued to have tenures of four months each on the cardiovascular service. In this period, Doctors Gustave Eisemann, Chesterfield G. Gunn, Frances Allen, Arnold Greenhouse, Marcella Krahenuhl, Robert Weber, James Crockett, John Christianson, Eugene Hamilton, Lilia Rodriguez, Thomas Coleman, Francis Lohrenz, and William Larsen have had this four-month experience.

C. *Fellows*: In addition, six men have taken fellowships in the laboratory of one year or longer. These men and their source of support are: Dr. Mario Anache, Rio de Janeiro, Brasil, Agnes Haskell Fellow; Dr. James Crockett, Kansas City, Kansas, Trainee, National Heart Institute; Dr. Fethi Gonlubol, Smyrna, Turkey, Agnes Haskell Fellow; Dr. Sherman Steinzeig, Kansas City, Trainee, National Heart Institute; Dr. Chesterfield Gunn, Bethany, Missouri, Research Fellow, American College of Physicians.

Dr. Chaveng Dechakaisaya, Bangkok, Thailand, fellow sponsored by the Department of Health, Education and Welfare, U. S. Public Health Service, spent three months in the laboratory.

Three men receiving training in enzyme chemistry joined Dr. Grisolia. They are: Dr. Jacob C. Towne, New York City, Trainee, National Heart Institute; Dr. Donald P. Wallach, New York City, Post Doctorate Fellow, National Heart Institute, and Victor R. Rodwell, London, England, U. S. Public Health Funds.

Dr. Sita Ram Kapoor, Ruckonw, India, has been in training with Dr. Kurt Reissmann during 1954-1955. Dr. Kapoor was sponsored by the Rockefeller Foundation.

For the first time the laboratory has offered an elective in cardiovascular diseases to medical students. Doctors L. A. O'Donnell, R. L. Jewell, R. L. Linscheid, M. S. Liggett, G. L. O'Connell, D. E. Raab, H. E. Arst, and Sylvan Busch have been with the unit in this role.

Dr. Chesterfield Gunn, completing a year with the unit, joined Dr. Magoun's laboratory in Los Angeles and is continuing his work in investigating cerebral factors in hypertension. Dr. Mario Anache completed his year, has returned to Rio de Janeiro, and is establishing his own cardio-physiological unit at Hospital dos Servidores.

D. *Visiting Professor*: For the first time the laboratory sponsored a visiting professor in cardiology. The first professor was Dr. Mariano Alimurung, associate professor of medicine, chief of Cardiovascular Section, School of Medicine, Santo Tomas Uni-

versity Hospital, Manila. Dr. Alimurung joined the laboratory for one month, February, 1955. He was a stimulating visitor and bolstered our teaching program at every level.

II. CLINICS, CONSULTATIONS, AND HOSPITAL SERVICE

A. *Clinics*: The laboratory has maintained out patient clinics in general cardiology on Monday and Friday mornings and Wednesday and Friday afternoons. Pediatric heart clinic is held on Wednesday and Saturday morning. A peripheral vascular disease clinic is held on Thursday mornings. Special clinics for research purposes are maintained on Monday afternoon for hypertension and on Tuesday afternoon for angina.

B. *Consultations*: The laboratory also offers consultation service to hospital patients. The total number of consultations and out patients seen by laboratory personnel and Dr. Diehl and Dr. Jordan in the two-year period was 5,764. Of these, 560 were in peripheral vascular disease.

C. *Hospital Service*: During this 24-month period, new bed patient facilities became available with the opening of the chest building. The laboratory maintains an 11-bed service there. The nurse in charge of this area has been Miss Dorothy Thomas. The dietitian has been Miss Dolores Flackmiller, and the social service worker has been Miss Mildred Webb. The residents assigned to the laboratory rotate at two-month intervals through this bed service. Daily teaching ward rounds are maintained by the laboratory. During the resident's second two months on the service, he is assigned to the out patient clinic and has responsibility for the out patient cardiac clinics and the daily interpretation of electrocardiograms.

III. PUBLICATIONS, EXHIBITS, POSTGRADUATE COURSES AND RESEARCH

A. *Publications*: The members of the laboratory published the following papers between May, 1953, and May, 1955:

Dimond, E. Grey; Kittle, C. F., and Lin T. K.: Cardiovascular laboratory, university of Kansas medical center: report of activities of first 24 months, May, 1951-May, 1953, *Journal of the Kansas Medical Society* 54:509-512 (Nov.) 1953.

Dimond, E. Grey; Santos, E. M., and Lin, T. K.: Occurrence of auricular fibrillation in immediate post-operative period following mitral valvulotomy. *Journal of Laboratory and Clinical Medicine* 42:799 (Nov.) 1953.

Dimond, E. Grey; Santos, E. M.; Mundy, William, and Calderwood, B. J.: An attempt to establish the presence of a hypocholesterolemic factor in the renal blood of dogs. *Journal of Laboratory and Clinical Medicine* 42:800 (Nov.) 1953.

Dimond, E. Grey, and Gonlubol, Fethi: Death fol-

lowing angiocardiology, *New England Journal of Medicine* 249:1029-31 (Dec. 17) 1953.

Dimond, E. Grey, and Berry, F. M.: Transmission of electrocardiographic signals over telephone circuits, *American Heart Journal* 46:906 (Dec.) 1953.

Dimond, E. Grey, and Jones, T. Reid: Pulmonary artery thrombosis simulating pulmonic valve stenosis with patent foramen ovale, *American Heart Journal* 47:105 (Jan.) 1954.

Dimond, E. Grey, and Santos, E. M.: Complications following mitral commissurotomy with special reference to auricular fibrillation, *Journal of the Kansas Medical Society* 55:120 (March) 1954.

Dimond, E. Grey: The general practitioner and the medical school, *The Journal of the American Medical Association* 156:95, 1954.

Dimond, E. Grey, and Andrews, Martin H.: Clinical thermometers and urinometers, determination of their accuracy, *The Journal of the American Medical Association* 156:125 (Sept.) 1954.

Dimond, E. Grey: How to conduct a medical program (Hostmanship), *GP* 11:142 (May) 1955.

Gonlubol, Fethi, and Dimond, E. Grey: Congenital pulmonary arteriovenous fistula, *Journal of the Kansas Medical Society* 56:146 (Mar.) 1955.

Grisolia, Santiago, and Marshall, Richard O.: Enzymic decomposition of the active intermediate in citrulline synthesis, *Biochim. Et. Bioph.* 14:446, 1954.

Grisolia, Santiago, and Burris, R. H.: Preparation of glutamate and carbamyl glutamate selectively labeled with deuterium, *The Journal of Biological Chemistry* 210:109 (Oct.) 1954.

Grisolia, Santiago, and Marshall, Richard O.: Recent advances in citrulline biosynthesis, amino acid metabolism, edited by William D. McElroy and Bentley Glass, *The Johns Hopkins Press*, Baltimore, 258, 1955.

Grisolia, Santiago; Burris, R. H., and Cohen, P. P.: Fate of deuterio-labeled carbamyl glutamate in citrulline biosynthesis, *The Journal of Biological Chemistry* 210:761 (Oct.) 1954.

Grisolia, Santiago; Wallach, Donald P., and Grady, Harold J.: Carbamyl transfer with mammalian and bacterial enzymic preparations, *Biochim. Et. Bioph.* 17:150, 1955.

Grisolia, Santiago; Grady, Harold J., and Wallach, Donald P.: Biosynthetic and structural relationships of compound X and carbamyl phosphate, *Biochim. Et. Bioph.* 17:277, 1955.

Grisolia, Santiago, and Wallach, Donald P.: Enzymic interconversion of hydrouacil and B-ureidopropionic acid, *Biochim. Et. Bioph.* 18:449, 1955.

Grisolia, Santiago: The potentiating effect of Digitoxin and Quinidine on dinitrophenol uncoupling of oxidative phosphorylation, *Biochim. Et. Bioph.* 18:437, 1955.

Grisolia, Santiago: Enzymatic citrulline synthesis methods in enzymology, 2:350, 1955.

Hardin, C. A.; Reissmann, Kurt R., and Dimond, E. Grey: The use of hypothermia in the resection and homologous graft replacement of the thoracic aorta, *Annals of Surgery* 140:720 (Nov.) 1954.

Hoelscher, B., and Reissmann, K. R.: The combined

effects of hypoxia adrenalectomy and thymectomy in parabiotic rats, *Endocrinology* 54:147, 1954.

Kittle, F.; Reissmann, K. R.; Dimond, E. G., and Schafer, P. W.: Torsion ballistocardiography in cardiovascular surgical patients, *J. Thoracic Surg.* 27:107, 1954.

Lin, T. K., and Dimond, E. Grey: Reliability of the grading of cardiac murmurs, *General Practice* 8 (July) 1953.

Reissmann, Kurt R., and Dimond, E. Grey: Torsion ballistocardiography: with special reference to patterns in surgically amenable cardiovascular diseases, *Circulation* 8:585 (Oct.) 1953.

Reissmann, K. R., and Dimond, E. G.: Is intravenous oxygen therapy possible? *Anesthesia and analgesia* 32:426, 1953.

Reissmann, K. R.; Boley, J.; Christianson, J. F., and Delp, M. H.: The serum iron in experimental hepatocellular necrosis, *J. Lab. Clinical Med.* 43:572, 1954.

Reissmann, K. R.; Coleman, T. J.; Budai, B. S., and Moriarty, L. S.: Acute intestinal iron intoxication, I. Iron absorption, serum iron and autopsy findings, *Blood* 10:35, 1955.

Reissmann, K. R., and Coleman, T. J.: Acute intestinal iron absorption II. Metabolic respiratory and circulatory effects of absorbed iron salts, *Blood* 10:46, 1955.

Reissmann, K. R.; Christianson, J.; Boley, T., and Kittle, C.: The relationship of serum iron changes, hepatic function and histological findings in experimental hepatic injuries of various etiologies, *Surgery* 37:738, 1955.

Reissmann, K. R., and Kapoor, S.: Dynamics of the hypothermic heart muscle (heart-lung preparation), *Am. Journ. Physiol.*, 1955, accepted for publication.

Books: *Electrocardiology*, by Dimond, E. Grey. Published by the C. V. Mosby Company, 1954.

B. Exhibits: Three exhibits were prepared. One, on the autonomic nervous system, was shown to the Kansas City Southwest Clinical Society, at the meeting of the American Academy of General Practice, at the Kansas Medical Society meeting, at the Chicago Medical Society meeting, and at the International Congress of Cardiology. A second exhibit, on the surgical treatment of aortic insufficiency, built in collaboration with Dr. Frederick Kittle, won first prize at the Kansas City Southwest Clinical Society meeting. A third exhibit, on pulmonary stenosis, won first prize at the Kansas Medical Society meeting.

C. Research: Clinical investigation, especially in the field of hypertension and angina, has been carried on. Laboratory work has been in the area of iron metabolism and hypothermia (Dr. Reissmann), effect of trace metals in cholesterol metabolism (Dr. Curran), effect of heparin on adenosine triphosphate (Dr. Dimond), and basic enzyme systems of the heart (Dr. Grisolia).

D. Postgraduate Courses: The laboratory has had considerable responsibility for postgraduate medicine.

In 1954 two courses were organized and presented. The first was jointly sponsored by the Kansas Heart Association and the Kansas City, Missouri, Heart Association and was a one-day program.

The second 1954 program was a four-day course restricted to auscultation and physical diagnosis. The guest speakers were Dr. Gordan S. Myers and Dr. Edward Wheeler, Boston, Dr. J. Willis Hurst, Atlanta, and Dr. Ernest Craige, Chapel Hill, North Carolina.

In 1955 two more programs were organized and presented. A two-day program on recent advances in heart disease, again sponsored by the Kansas Heart Association and the Kansas City, Missouri, Heart Association, was presented in February. The guest speakers were Dr. Louis Katz, Dr. Henry Russek, and Herman Hellerstein. In March a four-day program in electrocardiography was presented.

In addition, two correspondence courses in electrocardiography are maintained by the laboratory. In this two-year period, 277 physicians enrolled in these correspondence courses.

IV. DIAGNOSTIC PROCEDURES

A. *Electrocardiograms*: During this two-year period 14,569 electrocardiograms were recorded, mounted, and interpreted. In the previous two-year period (1951-1953), 13,546 had been done. The records have been 12-lead tracings, obtained on direct writing equipment. A photostatic copy of each record is placed on the chart; the original is filed in the cardiovascular laboratory. Each record is cross indexed, according to name and according to diagnosis. The technician responsible for this area has been Miss Margaret Delich, assisted by Inez Claxton, Ilah Plumb, Mary Baker, and Bernice Bain.

B. *Peripheral Vascular Studies*: A weekly clinic in peripheral vascular disease has been maintained. The responsible staff man has been Dr. Robert Jordon. The residents in medicine and the fellows in cardiology rotate through this clinic. Five hundred and sixty patients were seen in this clinic. In addition to the medical staff, an attending chiropodist is present, Dr. Irvine Waxman. Detailed peripheral work-ups were done on about one-fifth of these patients:

Plethysmograms	64
Skin Temperatures	76
Landis Test	44
Oscillometric Study	42
Cold Pressure Study	5
Posterior Tibial Block	27
Lumbar Block	35
Stellate Block	5
Intra-arterial Priscoline	17

The technician responsible for this work is Mrs. Lavina Goering.

C. *Cardiac Catheterization*: Cardiac catheterization

has continued to be a heavy responsibility of the unit. Dr. T. K. Lin has been responsible for this area. Dr. Mario Anache and Dr. Fethi Gonlubol have assisted him and have been trained in the technique. The technicians have been Herbertine Clark, Barbara Cullen, and Donna Sims. In this two-year period, 244 patients were catheterized. (In the previous two-year period, 130 had been done). The first death since the formation of the team occurred. This patient was two months old. As the catheter entered the right ventricle, ventricular fibrillation occurred. Cardiac massage was immediately begun and continued for two hours. Autopsy revealed atrioventricular communis and fibro-elastosis of the auricle.

The principal temporary complications were: chilling, 5; nausea, 3; vomiting, 1; fever, 2; venous spasm (severe), 1; bundle branch block (temporary), 1; complete A-V block (temporary), 1; ventricular tachycardia (temporary), 9.

D. *Angiocardiography*: Fifty-three angiocardiograms were done. These were done by Dr. T. K. Lin and Dr. Antonio Diehl with radiographic help from Dr. Galen Tice, Dr. Donald Gerrmann, and Dr. Karl Youngstrom of the Department of Radiology. One death occurred in a three-week old male, immediately after the injection of the contrast agent; transposition of the great vessels was present.

E. *Aortograms*: Twenty-six translumbar aortograms were done by the laboratory. These were done by Dr. T. K. Lin. No deaths occurred. Extravasation of dye along the aorta occurred in two without complications.

F. *Ballistocardiograms*: The shin-bar apparatus was used and 280 ballistocardiograms were recorded on 251 patients.

G. *Phonocardiograms*: These (120) were done by Dr. Sherman Steinzeig, Dr. Fethi Gonlubol, and Dr. Mario Anache. This procedure is very exacting and time consuming.

V. SURGICAL PROCEDURES

The members of the laboratory, working in association with the Department of Surgery and the Department of Pediatrics, had the opportunity of following a considerable number of cardiovascular surgical procedures. The surgery was done by Dr. Frank Allbritten, Dr. Creighton Hardin, and Dr. Frederick Kittle.

A. *Patent Ductus Ligation*. Twenty-four ligations were done; 16 were also transected.

B. *Coarctation of the Aorta*. Eight resections were done, with a graft necessary in one.

C. *Blalock Procedure* (Subclavian artery anastomosed to pulmonary artery). Thirteen attempts were made. These patients were frequently small infants in extremis and for whom surgery was a calculated gamble.

D. *Brock Procedure* (Pulmonary valvulotomy). Twenty-two valvulotomies were done.

E. *Pott's Procedure* (Aortic pulmonary artery anastomosis).

F. *Mitral Valvulotomy*. Seventy-five valvulotomies were done.

G. *Tricuspid Valvulotomy*. One.

H. *Aortic Plastic Valve* (Hufnagel). Six plastic valves have been inserted.

I. *Aortic Valvulotomy*. Five.

J. *Pericardectomies for Constrictive Pericarditis*. Two patients were operated upon with good results.

K. *Talc Installation in Pericardium*. Two.

L. *Aneurysm Repair*. This work has been done by Dr. Creighton Hardin: abdominal aneurysm, 22; thoracic aneurysm, 3; femoral aneurysm, 5; popliteal aneurysm, 2; carotid aneurysm, 5; repair of Leriche syndrome, 17.

M. *Thoraco-Lumbar Sympathectomy*, 11. Six patients, five bilateral.

N. *Exploratory Cardiomyotomies*, 11.

The majority of these patients had rheumatic valvular disease and cardiomyotomy was done because the possibility of mitral stenosis was suspected but atypical clinical findings were present.

O. *Inferior Vena Cava Ligation*, 2.

P. *Excision Pericardial Cyst*, 1.

Q. *Auricular Septal Defect Repair*, 2.

VI. GRANTS

The medical school state budget funds continue to be the basic major support. The National Heart Institute, through its Undergraduate Cardiovascular Teaching Grants, has continued to be the principal outside support. This yearly grant has permitted us to add personnel, obtain equipment, and develop the laboratory in a manner which would otherwise be impossible.

The National Heart Institute has also supported, as trainees, Dr. James Crockett, Dr. Sherman Steinzeig, Dr. Jacob Towne, Dr. Donald P. Wallach, and Victor Rodwell.

Income from the Agnes Haskell Endowment has been utilized for the support of the first Haskell fellow, Dr. Fethi Gonlubol.

The McIlvaine Trust awarded the laboratory sufficient funds to permit the equipping of a four-room

laboratory suite and also partial support of the director of this unit. This laboratory, designated the Frederick McIlvaine Trust, is a gift of Lettie B. McIlvaine in memory of her husband. Research in the field of enzyme metabolism, as it relates to heart muscle, is carried out here on the direction of Dr. Santiago Grisolia.

The McIlvaine Trust also made a substantial grant to Dr. George Curran's work in the field of cholesterol metabolism.

A grant from the National Heart Institute, made to Dr. Reissmann and Dr. Tom Hamilton, Department of Microbiology, for investigation of pulmonary hypertension, was received in 1954 and 1955.

The American Heart Association has made a major contribution in the support of Dr. Curran and Dr. Santiago Grisolia as established investigators.

The Kansas Heart Association helped in the maintenance of the cardiac catheterization team in 1954.

Other support came from the Peggy Nygaard Fund and the Jules Friburg Memorial Fund.

SUMMARY

The second two years of operation of the University of Kansas Cardiovascular Laboratory ended May, 1955. The staff now consists of two clinical cardiologists and three basic investigators. One more man will be added this year to develop the peripheral vascular section.

In the first four years since the opening of the laboratory, 28,115 electrocardiograms have been taken, 9,530 consultations given, 374 cardiac catheterizations done, 79 angiograms made, and approximately 361 major cardiovascular operations performed at the University of Kansas Medical Center. The Cardiovascular Laboratory, the Department of Surgery, and the Department of Pediatrics have participated jointly in this work.

SUMMARY OF CARDIOVASCULAR ACTIVITIES, KUMC, 1951-1955

	1951-1953	1953-1955
Consultations	3,766	5,764
Electrocardiograms	13,546	14,569
Cardiac Catheterizations	130	244
Angiocardiograms	26	53
Operations	130	231

No one treatment is successful with every alcoholic patient. The needs of alcoholics vary both in the psychic and physiological realms. It is recognized that a "total push" is the best and most successful method of bringing the largest number of alcoholics to recovery. One physician may minister to the physical needs of the patient; another may lead him to an integrated emotional life through psychotherapy.

PRESIDENT'S PAGE

DEAR DOCTOR:

Have you had your vacation? To those of you who have, welcome back. To those of you who have not, bon voyage.

You should have a vacation. It seems to me that each doctor should make it a must. The working day is so long mental fatigue comes easily, and a chip on the shoulder looms larger and is more quickly toppled over. You owe it to yourself and your patients since you will return in a much better and clearer frame of mind.

September has arrived and all committees will be meeting in the next few months. Some have already done so, and it is hoped that all members will be attentive and forthgiving with advice and wisdom. These committees are the backbone of this organization. Their effectiveness depends upon your contributions.

Fraternally,

Clyde H. Miller M.D.

President

EDITORIAL COMMENT

What's Wrong with Medical Organizations?

Editor's Note. The following report, prepared by the American Medical Association, gives a partial answer to the question above.

A nationwide survey of physicians, commissioned by the AMA, shows that medical organizations can profit by internal inspections. Difficulties may be minor, but, according to some physicians, medical organizations aren't hitting on all cylinders.

Medical organizations must give increased attention to the problem of boosting meeting attendance and devote more efforts to drawing all members into active society participation. Individual physicians need more information about actual benefits of membership as well as about policies and projects of their medical organizations. Too many physicians apparently don't know the facts about their own organizations.

Survey findings brought the need for attention to some of these problems into sharper focus. For example, only half of the physicians in this country report they are active in county and state organizations. One doctor in four says he didn't vote in his local society's last election. More than a third say they belong only to medical specialty groups not associated with the AMA, or that they are more active in these other organizations.

Furthermore, about half of the doctors think of county and state societies as being different from the AMA, when in reality these organizations compose the national association. Additional break-downs in the lines of communications between individual members and their organizations show up in misunderstandings about medical policies and lack of knowledge about organizational activities and services. A typical misconception has to do with dues; only half of AMA members actually know what national dues are, and most doctors overestimate rather than underestimate dues.

It's encouraging to find that 90 per cent of doctors in private practice report they are members of the AMA. More than half of the AMA members surveyed reported they belong to the association because it's customary, it's the doctors' organization, or they believe in its policies. Yet 15 per cent say membership is necessary for hospital affiliation or that it's compulsory. Informed physicians know that hospitals, not medical societies, determine rules and regulations for securing hospital privileges. And, no physician is forced to associate himself with any

medical organizations; if he joins, he does so voluntarily.

Many doctors cite AMA services or activities which they like, such as the JOURNAL, meetings and conventions, information and exchange of ideas, and legislative action. But others say the association is not representative, criticize it for being remote and uninterested in the individual physician, and complain about its conservatism. Consequently, about a fifth of the members say they do not get value received for their AMA dues.

Although survey questions asked only about physicians' opinions in regard to AMA services, activities, and policies, similar criticism would no doubt have been given had doctors been asked their opinion about their state associations. All along the organizational line, it's apparent that a better informational job needs to be done. The aid of state and county groups is needed to help sell physicians on the merits of cooperative action through medical organizations. For when a physician criticizes AMA, he is actually criticizing his local society and his state association, too. When his society joins in the complaining, the breach within the ranks widens.

In the minds of some medical men a mythical "giant" has been built up in AMA. Newspapers have contributed to this illusory creation. AMA is an influential organization, and since it comprises the greatest percentage of physicians in this country, it rightly claims title of official spokesman for the profession. Yet over the years critics of organized medicine have chiseled a psychological rift by saying, "You individual MDs are ok and you're doing a good job—but AMA off in Chicago or Washington is the villain!" In reality, the individual physician is AMA. Repetition of this idea has made it harder—or less desirable—for an individual physician to identify himself with the AMA.

This insidious dissociation process may be a contributing factor to the splintering off into smaller specialty groups which has been becoming more widespread in the past few years. Unaffiliated organizations are less controversial; with one or two exceptions they have received far less attention in the public press. When physicians who said they were more active in these specialty groups were asked why, they gave these replies: my specialty; local, closer; more interesting; smaller, more social; more worthwhile; easier to get to meetings. One clue for alert societies aiming at greater member participation was given in the response by some doctors that "there's nothing to do in the AMA."

Although the scientific programs of specialty groups will always hold appeal for numbers of physicians, the danger lies in the tendency of such organizations to begin speaking out separately on

non-scientific matters affecting medicine. When many organizations begin professing to speak for medicine, the public becomes confused and the over-all impression is given that the members of the medical profession can't agree among themselves. Nobody denies the right of members to criticize their own organizations or to disagree with their actions; yet there are times when it is vital for medicine to present a united front. Those who believe in democracy accept the premise that the opinions of the majority should prevail—until the minority can change the opinions of that majority.

The links in the chain of medical organization are the county and state associations. When poor attendance weakens their effectiveness, the collective strength of the entire profession is diminished. According to the survey, 50 per cent of the doctors attend most meetings of their local or county society. Yet 6 per cent say they attend no meetings, 16 per cent very few, 9 per cent some, and 9 per cent half. The problem of meeting attendance appears to be greatest in the East, where only 38 per cent of the doctors say they attend most meetings. Western states evidently chalk up the greatest attendance since 61 per cent of the doctors say they turn out for meetings. Central and Southern states fall midway between, with 54 per cent in the Midwest and 56 per cent in the South attending most meetings. One or two other interesting sidelights were revealed in the study. For example, internists least often say they attend county meetings. Only 35 per cent of the internists say they attend most meetings as contrasted with an average of 50 per cent of all other types of doctors. Internists also least often say they voted in the society's last election of officers.

Doctors in the East least often believe they get their money's worth in return for dues (32 per cent as against an average of 23 per cent.) Here again internists reflect a less favorable attitude toward medical organizations than other doctors. Twenty-six per cent of the internists feel full value is not received in return for dues, while general practitioners least often express dissatisfaction on this count (21 per cent).

Another revealing discovery is that doctors rate the American Dental Association higher in terms of favorable impressions than they do their own medical organizations. About three out of four doctors say their impressions of both the AMA and the ADA are all good or more good than bad. Yet, one doctor in 12 says he has negative impressions of AMA while only one in 50 is critical of the dental association. Doctors rank the American Bar Association in third place.

Time after time in the study the individual physician proved to be far more critical of his colleagues

and of medical organizations than the public. For example, 24 per cent of the doctors say the public looks upon AMA as a doctors' union and medical trust. Yet, this survey shows only 37 per cent of the public has this opinion. During the past few years, the medical profession has worked hard to regain the confidence and good will of the public. Now it's obvious that some concentrated internal public relations efforts are necessary in order to rekindle physicians' enthusiasm and interest in medical organizations. Larger numbers of physicians ought to be pulling their own weight in their societies, rather than dragging their heels and allowing a few men to serve as standard bearers. Medical organizations must concentrate on doing a better job of informing their members about their activities, policies, and services.

Physicians, in an effort to revamp their service programs for the public and to stave off a government medical program, have taken it on the chin from many critics. Most have accepted just criticisms humbly and moved ahead to correct sources of dissatisfaction. Perhaps it's time now to stop being on the defensive—to help physicians regain a sense of pride in the medical organizations to which they belong. An organization whose aims are "to promote the science and art of medicine and the betterment of public health" need not apologize for its efforts to advance these noble objectives.

The Chaplain and Medicine

The chaplain in the hospital has an assignment that is unique: to be clerical and (help be) medical. He has access to the critically ill list, emergency room calls, the surgical department—in fact, he is today to be found anywhere in the hospital on call for his particular services to patients or to their visiting relatives and friends. His assignment is to help people of all races, colors, and creeds, regardless of his particular religious denomination. In this way the doctor is most often helped to shoulder the burden brought to him in the care of the seriously ill.

Friendliness is one of the virtues of the chaplain. Frequently there are gravely ill patients who have no relatives or friends to be contacted. These patients are lonely and depressed mentally, conditions that do not help recovery. A friendly hospital visit by the chaplain and his help in reaching acquaintances do much to give the patient a "lift" and may speed his getting well.

The role of the chaplain as a minister would seem to be his "mission" in his relationship to the patient and the doctor. Here, as the minister, he attempts to soothe the patient by showing him that regaining his spiritual strength will help in the recovery of his

physical strength. He may even resort to the dogma "There was never an atheist in a foxhole," knowing full well that patients become pensive while ill and take inventory of themselves. Even though they never professed religious inclinations, they may feel they should go along with the idea since "There might be a lot to gain and nothing to lose."

Then, of course, there is the facetious side to the chaplain's talk to the seriously ill (who will not take to the idea of religion): the talk will sometimes take the patient's mind off his ailment and thus give him physical relief.

The chaplain acts further as a liaison officer between the patient and the doctor (and the family). On many occasions the doctor asks the chaplain to talk to the family or friends, or even the patient, on various pertinent subjects regarding the illness. Quite often the procedure is reversed, and the patient or the chaplain confers with the doctor.

The question arises as to how a chaplain should approach a patient. There are many methods, depending on the kind of patient and the kind of illness. If the patient is surgical, a chat with the relatives during and immediately after the operation would be in order. Making an appearance to say a cheerful "hello" to the patient for the first two or three days is probably all right. However, it would be wise to wait about three days before making a visitation, barring an emergency, because of the following: the patient may become frightened or worried at the presence of the chaplain, or he may not be receptive to the chaplain's presence because of fatigue, sleepiness, or too many visitors in the room, or he may even go so far as to think the chaplain is a meddler. On the other hand, if the patient is a medical case, this condition has existed for at least a short while prior to hospitalization and the call can be made promptly.

The visit should be brief in most cases. There will be times, however, when the patient will probably ask that the chaplain remain and chat with him; should this occur, moderation should be the rule. Very little concerning the patient's illness should be said; rather, the talk should be about more pleasant ideas, such as nice things about the patient's relatives, etc. Occasional flattery of these individuals does no harm. I have seen persons with cancerous conditions completely forget about their ailments as their eyes light up with pleasant reminiscences during such talks.

Most important of the "don'ts" for chaplains is: do not offer medical advice to the patient or attempt to pass judgment on the medical care being given him by his doctors, nurses, and other hospital personnel. Should he see the conversation drifting in this direction, he should immediately steer clear and switch to other topics, always being sure, however,

to avoid argumentative subjects, as politics, stock market, etc.

The doctor feels more secure if the chaplain supports him should the condition of the patient worsen. Also, the doctor is appreciative if the chaplain come to his defense should certain wild, unfounded malicious rumors and accusations be thrown at him by well-meaning (?) but emotionally upset relatives in the case of unfavorable progress of the patient.

Close cooperation of the chaplain with the doctor on the case is a necessity. The chaplain is seen to be the "man-between" in the making of contacts of distantly located relatives and friends; he is the man to help raise the mood and spiritual level of the patient in order to create a better attitude which is conducive to greater and faster recovery.

It must be reiterated that he is the friend of the doctor.—*William W. Abrams, M.D., Kansas City.*

Society Studies Indigent Care Program

The Riley County Medical Society is currently studying statistics to determine the percentage of payment to physicians for caring for indigent patients under the present program of the Department of Social Welfare. The society is dissatisfied with the allowance of \$2.00 per family per month, feeling that the amount is inadequate and unrealistic for covering medical and surgical fees for office and house calls and hospital care.

The society has set up a minimal fee schedule for indigent care based on the minimal Blue Shield schedule for medical and surgical fees for hospitalized patients and a comparable schedule for office and home care. Allowances are also made for laboratory and x-ray procedures in the office. Physicians render statements monthly to their society's Committee for Indigent Care.

The committee scrutinizes all statements and issues checks to individual physicians, pro rating the amount available from the \$2.00 per family allowance against the total charges. The sum received by the physician represents payment in full for services rendered.

The study so far indicates that physicians are collecting from one-fourth to one-third of the amounts billed each month.

At the close of the first quarter of 1956, according to the Treasury Department, one person of every four in the nation owned one or more savings bonds.

Hospitals during 1955 received more than \$885 million for the care of eight million Blue Cross members.

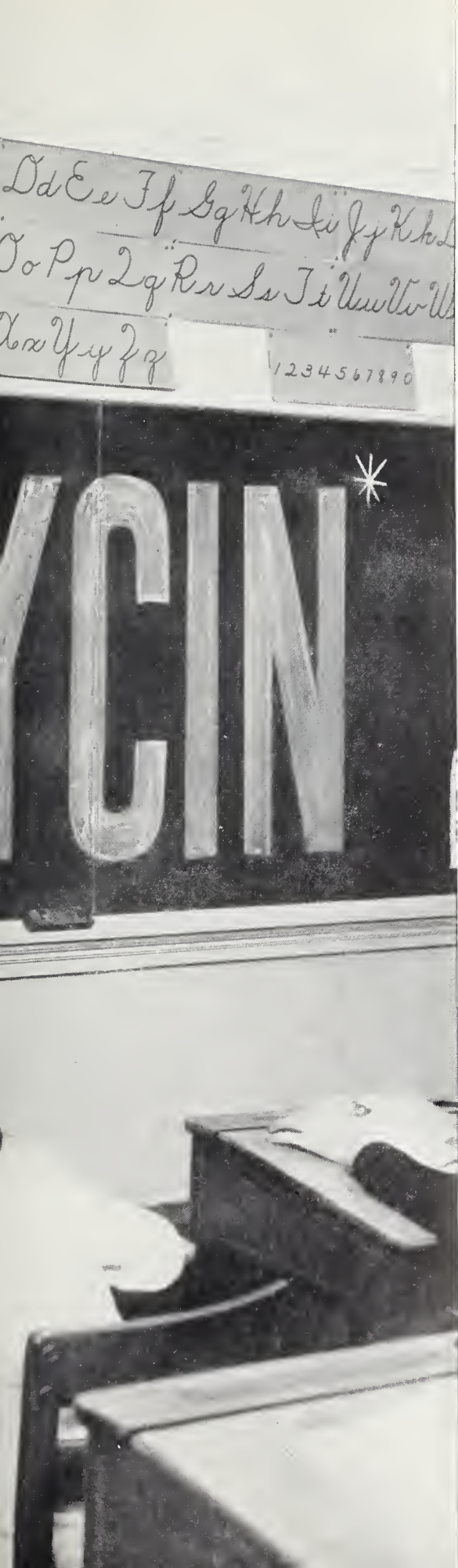
MAPS

THE WORLD



ACHRON





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January and his associates¹ have written on the use of tetracycline (ACHROMYCIN) to treat 118 patients having various infections, most of them respiratory, including acute pharyngitis and tonsillitis, otitis media, sinusitis, acute and chronic bronchitis, asthmatic bronchitis, bronchiectasis, bronchial pneumonia, and lobar pneumonia. Response was judged good or satisfactory in more than 84% of the total cases.

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ACHROMYCIN with STRESS FORMULA VITAMINS. Attacks the infection—defends the patient—hastens normal recovery. For severe or prolonged illness. Stress formula as suggested by the National Research Council. Offered in Capsules of 250 mg. and in an Oral Suspension, 125 mg. per 5 cc. teaspoonful.



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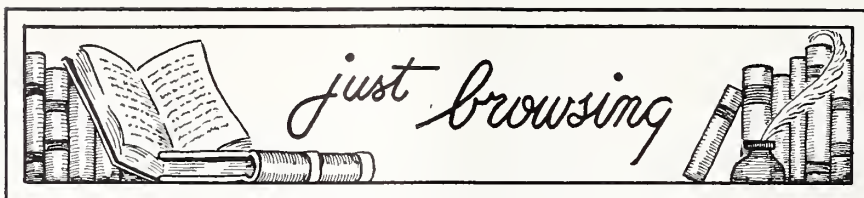
¹January, H. L. et al: Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.



LEDERLE LABORATORIES DIVISION
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^{*}REG. U. S. PAT. OFF.

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Publication of Alan Beck's description of a girl in the August issue of the JOURNAL demands printing also his classic, "What Is a Boy," which follows.—O. R. C.

Between the innocence of babyhood and the dignity of manhood we find a delightful creature called a boy. Boys come in assorted sizes, weights and colors, but all boys have the same creed: To enjoy every second of every minute of every hour of every day and to protest with noise (their only weapon) when their last minute is finished and the adult males pack them off to bed at night.

Boys are found everywhere—on top of, underneath, inside of, climbing on, swinging from, running around or jumping to. Mothers love them, little girls hate them, older sisters and brothers tolerate them, adults ignore them, and Heaven protects them. A boy is Truth with dirt on its face, Beauty with a cut on its finger, Wisdom with bubble gum in its hair, and the Hope of the future with a frog in its pocket.

When you are busy, a boy is an inconsiderate, bothersome, intruding jangle of noise. When you want him to make a good impression, his brain turns to jelly or else he becomes a savage, sadistic, jungle creature bent on destroying the world and himself with it.

A boy is a composite—he has the appetite of a horse, the digestion of a sword swallower, the energy of a pocket-sized atomic bomb, the curiosity of a cat, the lungs of a dictator,

the imagination of a Paul Bunyan, the shyness of a violet, the audacity of a steel trap, the enthusiasm of a firecracker, and when he makes something he has five thumbs on each hand.

He likes ice cream, knives, saws, Christmas, comic books, the boy across the street, woods, water (in its natural habitat), large animals, Dad, trains, Saturday mornings and fire engines. He is not much for Sunday School, company, schools, books without pictures, music lessons, neckties, barbers, girls, overcoats, adults or bedtime.

Nobody else is so early to rise, or so late to supper. Nobody else gets so much fun out of trees, dogs and breezes. Nobody else can cram into one pocket a rusty knife, a half-eaten apple, three feet of string, an empty Bull Durham sack, two gumdrops, six cents, a slingshot, a chunk of unknown substance and a genuine super-sonic code ring with a secret compartment.

A boy is a magical creature—you can lock him out of your workshop, but you can't lock him out of your heart. You can get him out of your study, but you can't get him out of your mind. Might as well give up—he is your captor, your jailer, your boss and your master—a freckle-faced, pint-sized, cat-chasing bundle of noise. But when you come home at night with only the shattered pieces of your hopes and dreams, he can mend them like new with the two magic words—"Hi, Dad!"

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

In terms of actual health bills passed and sums of money appropriated, the 84th Congress which ended just a few weeks in advance of party presidential conventions undoubtedly set some records. Measures ranged from the far-reaching program of disability cash payments to a bill for the commissioning of male nurses in the armed services.

In between are a wide variety of measures which, in the opinion of Secretary Folsom, secretary of Health, Education, and Welfare, gives "promise of immediate and substantial progress on a wide front in the improvement of the nation's health."

Both Mr. Folsom and the President deplored the fact that Congress had not acted on their plan for federal aid to medical schools, but Congress decided this was one of the subjects that needed more study before taking any further action. In addition Mr. Folsom expressed disappointment that nothing had been done on authority for pooling arrangements among small health insurance companies and the long-dormant plan for a health reinsurance fund.

On medical research funds, the administration this session asked for the largest amount of money ever requested in one year. The appropriation finally voted was even larger, some \$170 million. On top of this, Congress in its final hours appropriated nearly \$80 million to carry out new legislation just passed.

Here are the highlights of major health bills approved by the 84th Congress:

Social Security Amendments—Changes in the 21-year-old social security law now include: (1) Old Age and Survivors Insurance payments to disabled workers at age 50, paid from a "separate" fund, (2) extension of social security to some 250,000 dentists, lawyers, osteopaths, and other self-employed persons, (3) lowering of retirement age for social security purposes for women from 65 to 62, (4) earmarked payments for medical care of public assistance recipients, and (5) increase of payroll deductions by one-half of 1 per cent and three-eighths of 1 per cent for the self-employed.

Laboratory Research Facilities—The Hill-Bridges bill for \$90 million in construction grants over three years to public and non-profit institutions to erect research facilities started out in the Senate as a bill to aid research in crippling and killing diseases but wound up for research in all "sciences related to health."

Health Amendments Act—The so-called little omnibus health bill provides for federal grants for training of public health specialists, professional nurses qualified for teaching and administrative jobs, and for practical nurses—plus a two-year extension beyond next July 1 of the 10-year-old Hill-Burton hospital program, and special projects grants for mental health studies and demonstrations.

Medical Care for Military Dependents—A long-sought goal of the Defense Department was enactment of a permanent program of medical care for dependents of armed services personnel either in military hospitals and clinics or through private sources. It is scheduled to begin early in December.

National Library of Medicine—Another proposal long in the making was the reestablishment of the Armed Forces Medical Library as the National Library of Medicine. For administrative purposes, Congress put it under the Department of HEW, but left up to the 17-man board of regents the selection of site—in all likelihood in the Washington area.

Sickness Survey—Special and continuing surveys on the extent of illness and disability in the U. S., along with medical care being offered, have been authorized—the first detailed study of it kind in over 20 years. The work will be done by the Public Health Service.

Water Pollution Control—The PHS is authorized to make grants to states and communities to help in construction of sewage disposal plants, at the rate of \$50 million a year for 10 years.

Some other measures signed into law by the President were: establishment of a mental health program for Alaska, budget increases for additional staff for the Food and Drug Administration along with a new headquarters building for modern laboratories, provision of medical care for employees and dependents of the State Department abroad in U. S. military facilities, a \$400,000 fund to finance the holding of the World Health Assembly in this country in 1958 (which is the 10th anniversary of the founding of the World Health Organization), and the commissioning in the armed services of osteopaths.

The new surgeon general of the PHS is Dr. Leroy E. Burney, a career officer in the commissioned corps and for 10 years commissioner of health for the state of Indiana. Until his nomination by the President he was deputy chief of the PHS Bureau of State Services. Dr. Burney received his medical degree from Indiana University.

The federal government withdrew from the allocation of the Salk poliomyelitis vaccine just 15 months after the first release of the vaccine, but federal grants to states to help finance inoculation programs continue.

Clinicopathological Conference

Recurrent Pulmonary Infiltration, Eosinophilia, and Terminal Neurologic Signs

CASE PRESENTATION

The case for consideration today is that of a 44-year old white woman who was first admitted to this hospital on January 23, 1949, and who expired here on January 29, 1955, during her sixth admission.

On her first admission she complained of a productive cough of two and one-half years duration. She had previously been in good health with the exception of recurrent upper respiratory symptoms which she attributed to hay fever and sinusitis. The cough was present in some degree at all times, but it was most severe and most productive in the morning and at night. The sputum was described as being greenish-yellow and of a stringy consistency. She estimated that she expectorated about one-half cup of sputum each day.

During the two years preceding her admission she had had recurrent bouts of fever which were attributed to respiratory infections, and she had had a gradual loss of strength and a 20-pound weight loss. Numerous skin tests had been performed, and she was placed on an elimination diet because she was allergic to many foods. She continued to be ill and required frequent parenteral medication for the relief of paroxysms of coughing and dyspnea.

Six months before admission she had had severe pneumonia, associated with occasional blood-tinged sputum, which improved only slowly on treatment with penicillin and sulfadiazine. Two months prior to admission she suffered a relapse and was hospitalized elsewhere, but she did not do well and was transferred to this hospital for evaluation.

Both of the patient's parents were living and well. One brother died at the age of six months; we do not know the cause of his death. The patient had two living sisters, one of whom had occasional urticaria. Her husband was living and well. They had no children.

In 1928 she had a tonsillectomy, and in 1933 a submucous resection was done. An appendectomy was performed in 1940, and an ovarian cyst was also removed at that time.

She was a native of the midwest and had lived here

all of her life with the exception of a few months residence in California in 1945. She did not use alcohol or tobacco and took no home remedies for her symptoms. She had occasional mild frontal headaches. There was progressive exertional dyspnea and some degree of orthopnea, but no ankle edema had been experienced. She had not had nocturia, frequency, or hematuria, and did not complain of gastrointestinal symptoms. The menstrual history was normal.

The patient's first admission to this hospital was January 23, 1949, to March 12, 1949, at which time it was noted that she was somewhat emaciated and appeared to be chronically ill. She was in acute respiratory distress. The blood pressure was 100/60, and the pulse was 120 and rhythmical. The head and neck were normal except that the nasal mucosa was injected, and there was a profuse serous discharge. She had a slight kyphosis, and coarse and fine moist rales were heard over both lung fields. The breath sounds were decreased over the left chest. The heart was normal in size, the tones were good, and no murmurs were heard. There was thought to be minimal clubbing of the fingers.

The urinalysis on this admission was normal, and the red cell count was 4,500,000. The white count was 20,000 on admission with 57 per cent neutrophils, 18 per cent lymphocytes, 17 per cent eosinophiles, and 7 per cent monocytes. Serologic tests for syphilis were non-reactive. The non-protein nitrogen was 30 mg. per cent, the creatinine was 1.2 mg. per cent, the blood sugar was 80 mg. per cent, and the carbon dioxide was 62 volumes per cent. The sedimentation rate was 19 mm. in one hour. Skin tests for tuberculin, blastomycin, and coccidioidin were negative, but the histoplasmin test was positive. The complement fixation test for histoplasmosis was negative. The sputum was cultured on several occasions, but it was never found to contain acid-fast bacilli.

The patient was treated with potassium iodide, aminophyllin, penicillin, khellin, and postural drainage. She had a low grade fever during the first few days of her hospitalization but then became afebrile. She was considerably improved at the time of her discharge.

At her second admission (May 12, 1949, to May 15, 1949) she was found to have gained 14 pounds and had no symptoms except that she tired easily.

On April 23, 1950, the patient was admitted for the third time in order that her condition might be

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

evaluated further, and she was dismissed on April 28, 1950. She had had occasional upper respiratory infections and a productive cough, but she had gained 22 pounds and seemed to feel well. Sputum cultures and guinea pig inoculations were again negative for acid-fast bacilli. The radiologist described a "shifting type of pneumonitis."

She was admitted a fourth time, October 21, 1952, to November 7, 1952, because of increasing symptoms and productive cough. She complained of shortness of breath and weight loss in spite of treatment at home with antibiotics, antihistaminics, and postural drainage. The physical examination at this time was essentially the same as it was on her first admission.

The urinalysis was within normal limits. The red count was 4,250,000 with 12.6 gm. of hemoglobin, and the white count was 13,150 with 65 per cent neutrophils, 13 per cent lymphocytes, 19 per cent eosinophiles, and 3 per cent monocytes. Skin tests were repeated and found to be negative except for an equivocal histoplasmin reaction. Oxygen and carbon dioxide studies on arterial blood revealed an oxygen capacity of 15.6 volumes per cent and carbon dioxide capacity of 44.5 volumes per cent before exercise; an oxygen capacity of 13.9 per cent with a carbon dioxide capacity of 43.8 per cent during exercise; and an oxygen capacity of 15.4 volumes per cent and a carbon dioxide capacity of 45.1 volumes per cent after exercise. Bacteriologic examination of the sputum again failed to reveal acid-fast bacilli, but *Histoplasma capsulatum* was reported in some of the sputum cultures. A pneumococcus was also found on routine sputum cultures. The complement fixation test for histoplasmosis was positive at this time.

Her treatment was continued as before with the addition of corticotropin and cortisone. She improved satisfactorily and was discharged on cortisone, antibiotics, and bronchodilators. Her vital capacity at the time of discharge was 1700 cc.

On August 2, 1953, the patient was readmitted for evaluation and was dismissed on August 6, 1953. Sputum cultures were negative for *Histoplasma capsulatum*, but the patient had a positive skin test and complement fixation test for histoplasmosis. She was discharged without any change in therapeutic regimen. After her dismissal she continued to do well and had no symptoms referable to her respiratory system, but in October, 1954, she began to complain of numbness and paresthesias of the left side of the face. She was seen by her family physician who told her that she had Bell's palsy. She was subsequently seen here as an outpatient, but no facial paralysis or weakness was noted.

Two months prior to her last admission the patient was in an automobile accident and received a blow to the right maxillary and frontal area. Following this

she complained of frequent mild headaches, and it was thought that there was some change in her personality. On January 11, 1955, she developed a severe frontal and right temporal headache and had an episode of vomiting. One week after this (and two days before her sixth admission to this hospital), her speech became slow and slurred, and she became lethargic. She was hospitalized elsewhere, but because of increasing lethargy and right hemiparesis, she was transferred to this hospital.

The patient's final admission to the University of Kansas Medical Center was on January 20, 1955, at which time she was in a good state of nutrition but was extremely lethargic. She was well oriented and cooperative when kept awake. Her temperature was 99.6 degrees, and her respiratory rate was 28 per minute. The pulse rate was 68, and the blood pressure was 120/65. No abnormalities were noted in the skin. Her speech was slurred. Ocular movements were normal, but the pupils were dilated and reacted only slightly to light. There was definite papilledema on the right and a suggestion of it on the left. Her tongue did not deviate on protrusion. Her neck was stiff. There was a right hemiparesis with Babinski's sign on the right. A few coarse rales were heard in both lung fields, but there were no expiratory wheezes. She did not seem to be in respiratory distress. The remainder of the physical examination was negative.

The red cell count was 4,400,000 with 12.4 gm. per cent of hemoglobin. The white count was 9,500 with 65 per cent neutrophils, 9 per cent eosinophils, 24 per cent lymphocytes, and 2 per cent monocytes. The urinalysis did not reveal any abnormalities. The blood non-protein nitrogen was 42 mg. per cent, creatinine was 1.5 mg. per cent, blood sugar was 95 mg. per cent, serum cholesterol was 332 mg. per cent, blood urea nitrogen 1.7 mg. per cent, and serum electrolytes were within normal limits.

A lumbar puncture was done on January 21. The initial pressure was 290 mm. of water, the spinal fluid had a ground glass appearance and contained 953 white cells (42 per cent of these were neutrophils, 58 per cent lymphocytes). The colloidal gold reaction was 5555210000. The Wassermann reaction was negative. Chemical analysis of the spinal fluid revealed 24.4 mg. per cent of sugar, 750 mg. per cent of sodium chloride, and 113 mg. per cent total protein.

On the day following admission the patient became progressively more stuporous, and a left carotid arteriogram was done. The following day she developed decerebrate rigidity and was totally unable to communicate, but her vital signs remained good. On January 23 a ventriculogram was done. By January 27 she was comatose and had fecal incontinence. At this time Babinski's sign was present bilaterally. She was breathing deeply and regularly. The temperature was septic in type, varying between 99 and 102 degrees.

The patient remained in a comatose state, and on January 29 she suddenly hiccoughed several times and stopped breathing.

Question: On the patient's first admission she had an eosinophilia; were her subsequent eosinophil counts elevated?

Dr. Robert W. Brown (resident in medicine): She consistently had eosinophilia. There were a few of the differential counts which showed only one or two, but the average was around 15 or 16 per cent.

Terry Denison (fourth year medical student):* Were there any neurological signs other than hemiparesis at the time of her last admission?

Dr. Brown: Babinski's sign was present.

Mr. Denison: Was there a loss of pain perception?

Dr. Brown: No, I do not believe so.

Dr. Mahlon Delp (moderator): No specific loss of pain sense was noted. This patient was obtunded a good bit of the time, and one could not really tell whether she was responsive or not.

Question: What was the nature of the sputum? Did it separate out on standing, and did it have a foul odor?

Dr. Brown: I do not believe the odor was described. The sputum was said to be greenish-yellow with a lot of water and mucus in it.

Michael McNalley (fourth year medical student): Were subsequent cultures and skin tests done?

Dr. Brown: She was skin tested on every admission. The histoplasmin was recorded as being equivocal on one admission; otherwise it was considered to be positive.

Question: Was her serum globulin normal?

Dr. Brown: Yes.

Dr. Delp: I think we should mention that there is one positive culture for acid-fast bacilli reported in this chart, and I do not believe it is on the protocol.

Question: Was that positive tubercle bacilli or positive acid-fast organisms?

Dr. Delp: Positive acid-fast.

Dr. Charles E. Brackett (neurosurgeon): Was the spinal fluid cultured?

Dr. Delp: The three cultures of the spinal fluid during her last admission were negative.

Ernie Chaney (fourth year medical student): Is anything known about the nature of the automobile accident? Was she driving, and were there other cars involved?

Dr. Delp: Other cars were involved. It is difficult to get an accurate story about what actually happened. I was interested in whether or not the patient was really injured. She apparently suffered a considerable blow from the accident, but I am not certain whether

she was groggy. Some say she was unconscious for a matter of a few minutes, but the patient told me that she was not. I do know that on the following day she was up and around the house and going about her normal activities.

Dr. H. E. Smith (internist): Was she taking cortisone right up to the time of her last admission?

Dr. Delp: Yes.

Dr. Smith: Was a blood sugar done at the same time that the spinal fluid was done on January 21?

Dr. Brown: The blood sugar was done on January 21, 1955, and the spinal fluid was dated January 23, 1955.

Question: The patient apparently had no fractures at the time?

Dr. Brown: No.

Francis O'Kane (fourth year medical student): Did she have chest pain?

Dr. Delp: I am sure that she had at least a dozen episodes of pleural pain.

Question: Did she have expiratory wheezing, and if she did was it throughout the whole chest?

Dr. Brown: Wheezing was described as being present throughout the whole chest. She had some rales throughout both lung bases and some dullness in the right third interspace.

Dr. Delp: She had obvious bronchospasm on numerous occasions when she was examined.

Dr. Brackett: Did she ever have any lymphadenopathy?

Dr. Delp: No.

Mr. O'Kane: Was there pain with her neck stiffness?

Dr. Brown: No, there was not.

Dr. Delp: Will you show the electrocardiograms, Mr. Ney?

Eugene Ney (fourth year medical student): The electrocardiogram taken on May 13, 1949, is within normal limits. The rate is approximately 100, and there is a normal sinus rhythm. The PR interval is 0.12 seconds, the QRS interval is 0.08 seconds, and the QT interval is 0.32 seconds.

The second electrocardiogram was taken on April 26, 1950, at the time of the patient's third admission. The rate at this time is 75 with a normal sinus rhythm. The PR interval is 0.12 seconds, the QT interval is .32 seconds. This tracing is within normal limits.

The third electrocardiogram was taken on October 22, 1952, at the time of the patient's fourth admission. The rate is 100. There is a normal sinus rhythm.

Electrocardiograms were taken during the patient's fourth and fifth admissions, and these were also normal tracings.

Dr. Delp: Will you interpret the x-rays, Mr. Penfold?

Richard Penfold (fourth year medical student):

* Though a medical student in February, 1956, when this conference occurred, he, like the others referred to as students, received the M.D. degree in June, 1956.



Figure 1. Chest x-ray, first admission.

This is the chest x-ray taken on the patient's first admission (Figure 1). The bony structure is normal. I cannot see the trachea very well to tell whether it is deviated, but I believe it is not. The costophrenic angles are clear. The outline of the heart is within normal limits. This is not a direct PA view, so there is a little distortion. There is some soft tissue infiltra-



Figure 2. Chest x-ray, second admission.

tion in the right upper lung fields. There are increased bronchial markings throughout, and there is some haziness indicating a pleural reaction.

The chest film taken on the second admission, at which time the patient had gained weight and was asymptomatic, shows clearing of the soft infiltrations that were present before. The costophrenic angles are clear. There is peaking of the diaphragms which indicates fibrous pleural adhesions. The contour of the chest throughout is a little bit square, which is consistent with some emphysema (Figure 2).

A bronchogram was taken on the third admission, when the patient had few respiratory symptoms. The soft tissue infiltrations are gone, but I think that there is saccular dilatation of bronchi and bronchioles indicating bronchiectasis (Figure 3).

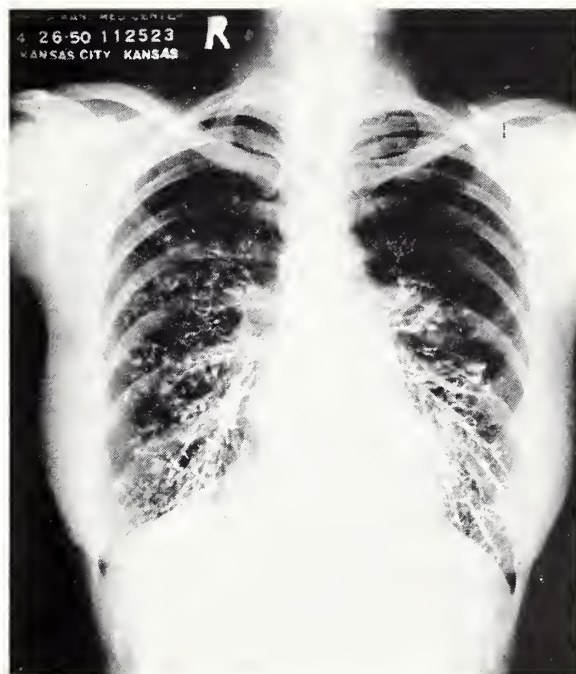


Figure 3. Bronchogram, third admission.

A Waters view of the skull was taken on the patient's third admission. We observe in the left maxillary region some haziness as compared to the orbits. The bony outline is even. This finding is consistent with left maxillary sinusitis.

On the fourth admission the x-ray of the chest shows an increase in the soft tissue infiltration most marked in the right upper lobe. There are large opaque lesions here for the first time, and it is at this time that the patient had a positive culture for histoplasmosis, so I postulate that these lesions could be consistent with aggravation of a primary histoplasmosis. The costophrenic angles are clear. There is some haziness of the pleural surfaces indicating a pleural reaction with effusion.

The chest film made on the patient's fifth admission does not demonstrate the previous lesions, but there is a suspicious lesion which looks like cavitation. The heart shadow is normal.

The final chest film, taken four days before her death, again shows a soft tissue infiltrate in the chest with pleural reaction. The costophrenic angles are clear.

Dr. Delp: Do you have any disagreement with this interpretation, Dr. Tice?

Dr. Galen Tice (radiologist): We did not see a cavity; otherwise his interpretation is all right.

Dr. Delp: This patient also had some arteriograms and ventriculograms. Would you tell us what those showed, Dr. Tice?

Dr. Tice: The arteriograms were reported as normal. I reported the ventriculograms as essentially normal. Filling was poor, which made them difficult to interpret, but they were passed as normal.

Dr. Delp: Dr. Tice, would you care to comment on how many different suggestions you made over a period of eight years about what might be in this chest?

Dr. Tice: Over eight years we made 27 examinations of various parts of the body. The first interpretation was pneumonia, but we could not rule out tuberculosis. As we saw the films at different times the lesion in the upper right chest persisted, and it looked something like a tuberculous scar. Loeffler's syndrome was suggested at one time, because of the high eosinophil count and the shifting pneumonia. Bronchiectasis was verified by the bronchograms. At one time the films suggested a nodular shadow, and the possibility of metastases or even primary tumor was raised. I think that she had pneumonia that kept recurring, and that perhaps she had a tuberculous lesion in the upper right chest.

Dr. Delp: Mr. Neumann, will you give your differential diagnosis?

DIFFERENTIAL DIAGNOSIS

James Neumann (fourth year medical student): Today we are concerned with a 44-year old white woman who came to this hospital about six years before her death with a history of chronic productive cough, weakness, periodic dyspnea, and weight loss. She apparently did reasonably well with medical management until about two and one-half years prior to death, when she was hospitalized with an exacerbation of her presenting symptoms.

Histoplasma were present in the sputum on that admission, and a complement fixation test for histoplasmosis was positive. The patient again did well until four months before her death, when numbness and paresthesia of the left side of her face developed. Two months before her final admission she had suffered a head injury in an automobile accident. During

the week prior to this admission she developed a severe headache, vomited, was lethargic, and developed a right hemiparesis. She continued to do poorly and expired on the tenth hospital day.

Initially the differential diagnosis is concerned with chronic productive cough. Heart failure in a 38-year old female without valvular disease, diabetes, or hypertension is unusual, and no clinical signs of failure were present. Bronchogenic carcinoma is not likely to progress so slowly. Pneumoconiosis may be ruled out by the absence of a history of exposure. Patients with pulmonary sarcoidosis exhibit few constitutional symptoms, and fever is unusual. This patient had recurrent febrile episodes. Fifty per cent of sarcoid patients have cutaneous nodules on the face, arms, or back. A slight anemia is usually present. I rule out sarcoidosis primarily on the basis of the severity of this patient's symptoms.

Pulmonary mycotic infections must be considered. Blastomycosis could have produced this patient's symptoms, but it is usually associated with the formation of sinuses from the bones or abdomen. Ninety-two per cent of the patients with disseminated blastomycosis die within two years. I rule out blastomycosis because of the negative skin tests, the absence of characteristic lesions, and the chronicity of the disease.

Coccidioidomycosis produces a primary pulmonary infection which usually heals in a few weeks. If dissemination occurs it usually does so within six weeks after the primary infection, and there usually are subcutaneous lesions. I rule this out on the basis of a negative skin test and the four-year interval since she was in an endemic area.

Actinomycosis occurs most frequently in the male. Lesions extend through the pleura and through the thoracic wall. I rule this out simply on lack of clinical evidence.

Patients with cryptococcosis may have isolated abscesses or subcutaneous masses. The majority of patients with cryptococcosis of the lungs have coexisting cerebral lesions. Therefore, at the time this patient was first seen, I would rule out cryptococcosis on the absence of cerebral symptoms.

I believe that this patient had a subclinical or clinical histoplasmosis at some time before her first admission to account for the positive skin test, but I do not believe that she suffered primarily with histoplasmosis because of the long duration of symptoms. The clinical course in cases of histoplasmosis is usually one and one-half to three months, and during the active phase the complement fixation is usually positive.

I rule out tuberculosis because of repeated failures to demonstrate the organism, the negative skin tests, and the patient's subsequent clinical improvement without anti-tuberculosis therapy. Lung abscess could not be ruled out in this patient until we saw the x-ray,

but I believe that if one had been present for approximately two and one-half years it would not respond to medical management, and she would have been operated upon during the first admission.

I think that she had asthma and bronchiectasis. There is a history of allergy and shots for the relief of dyspnea and coughing; also an elevated eosinophil count strongly suggests asthma. Bronchiectasis may accompany asthma and is particularly likely to occur in those asthmatics who exhibit Loeffler's syndrome. Her early morning sputum is characteristic of bronchiectasis, and we have x-ray evidence of bronchiectasis.

I believe that she developed histoplasmosis prior to her fourth admission, and that she ran a typical clinical course with remissions. I do not believe that dissemination occurred at that time.

I cannot explain the numbness and paresthesia of the left face which occurred four months before her death. She could have had Bell's palsy with complete remission. Her terminal episode was characterized by general and focal cerebral signs. She must have had a lesion in the left frontal lobe involving the motor area. The history of head trauma two months previously would suggest a subdural hematoma, but the cerebrospinal fluid is not compatible with a subdural hematoma.

A brain tumor, particularly a glioblastoma, is compatible with this clinical course, but the cerebrospinal fluid is not typical of a brain tumor. I cannot rule out brain tumor on the basis of cerebrospinal fluid alone.

A brain abscess could produce this clinical picture and is compatible with the cerebrospinal fluid findings. The marked bradycardia which she had is more consistent with a brain abscess than with a brain tumor. In the absence of osteomyelitis of the skull, mastoiditis, or a depressed skull fracture, a hematogenous source is perhaps the most likely one for the formation of an abscess. Bronchiectasis could have provided the focus. A hematogenous abscess more frequently occurs on the left than on the right and is nearly always above the tentorium, usually occurring in the area supplied by the middle cerebral artery. I, therefore, believe that this woman had a brain abscess in the left frontal lobe, and that her death resulted from brain stem compression.

CLINICAL DISCUSSION

Dr. Delp: Mr. Nason, I would like to know what you think this patient's initial illness was. Apparently she had been getting along quite well when she developed an acute illness which had become chronic by the time she arrived here. What do you think was the matter with her? What happened?

Herbert Nason (fourth year medical student): I believe that she had chronic bronchitis which started

in 1947. At that time she could have had a primary exposure to histoplasmosis, or developed an acute pneumonia which aggravated the damage which had already been done to the bronchi by an allergic bronchitis or a true bronchial asthma. This precipitated a full-blown bronchiectasis.

Dr. Delp: I think we have inadvertently withheld some information that has to do with some skull films. Someone suggested a petrositis in this patient. Do you recall these films, Dr. Brackett?

Dr. Brackett: I thought that there was some rarefaction in the petrous pyramids.

Dr. Delp: Mr. Neumann, does this make you want to revise your diagnosis in any manner?

Mr. Neumann: I have revised it too many times.

Dr. Delp: Mr. McNally, what do you think?

Mr. McNally: I believe that she had a brain abscess.

Dr. Delp: Bacterial?

Mr. McNally: I cannot say what caused it.

Dr. Delp: Do you think she had a tuberculous abscess?

Mr. McNally: She could have had a tuberculoma, and she could have had an abscess caused by nocardiosis.

Dr. Delp: Mr. Charles, do you have any ideas about this? What is your diagnosis?

Jess Charles (fourth year medical student): I could not say whether she had a tumor or an abscess, although it is one of the two. I could not find any good explanation for the occurrence of an abscess.

Dr. Delp: Do you think there is any direct relationship between the illness this woman developed in 1947 and her death in January 1955?

Mr. Charles: Bronchiectasis could be the focus for hematogenous dissemination of a brain abscess. I do not believe that histoplasmosis had much to do with her death.

Dr. Delp: Mr. O'Kane, what are your thoughts about the matter?

Mr. O'Kane: I am tempted to stay with tumor.

Dr. Delp: Tell us what kind of tumor.

Mr. O'Kane: It would have to be a rapidly developing one such as a medulloblastoma.

Dr. Delp: Mr. Odum, what do you think was the final diagnosis?

Usim Odum (fourth year medical student): It does not seem to me that there is a disagreement. I think meningitis was present, not that it was the main diagnosis, but I am not able to account for the stiffness of the neck otherwise.

Dr. Delp: Accepting the idea of meningitis now, what about the etiology, etiological agents, pathogenesis?

Mr. Odum: You put me in some difficulty there,

because somewhere in the protocol there was some mention of culturing pneumococci.

Dr. Delp: Mr. Ney, this patient had neurological symptoms and, as a matter of fact, I think she had neurological signs in October prior to her death in January. Do you see any connection between the two?

Mr. Ney: That would seem to indicate that she had a neoplasm rather than a brain abscess. However, I will go along with brain abscess because 5 per cent of those having bronchiectasis develop brain abscesses, and glioblastoma does not occur that often.

Dr. Delp: Mr. Penfold, this patient received antibiotics from 1947 until 1955, and she received cortisone for the last two years of her life. The dosage varied from 50 mg. to 300 mg. in a month, probably not more than that, and she would sometimes go two or three months without taking any cortisone at all. What influence do you think these medications might have had on her terminal illness?

Mr. Penfold: Her terminal illness was, in my opinion, due to a brain abscess. The fact that she was on antibiotics and cortisone would increase the virulence of the organisms and also depress her immunity and inflammatory reaction. If she had a hematogenous abscess from the lung, it could have been a slow smoldering type of abscess seeded a long time before her death.

Dr. Delp: How long?

Mr. Penfold: A brain abscess can go on for years.

Dr. Delp: Eight years?

Mr. Penfold: Yes.

Dr. Delp: Dr. Williamson, may we have your comments?

Dr. William P. Williamson (neurosurgeon): We saw the patient when she was acutely ill with papilledema, right hemiparesis, and a stiff neck. She had chronic pulmonary pathology and, of course, we were concerned whether she had tuberculous meningitis, fungus meningitis, or a brain abscess. We needed spinal fluid badly, but one hesitates to do a spinal puncture if there is increased cerebral pressure, particularly if there is an abscess. So the first definitive test to make it safe to do a spinal puncture was done, namely, an arteriogram to see whether there was a shift of her anterior cerebral arteries indicative of a cerebral mass or whether she had evidence of hydrocephalus caused by a cerebellar mass. A negative arteriogram ruled out an abscess or tumor of any size.

A spinal tap was then done, and it confirmed chronic meningitis of an unknown type on the basis of increased cells, lowered sugar, and increased protein. With no evidence then of intercranial mass, the neurosurgeons tended to relax until the laboratory and medicine departments could determine the etiology of the chronic meningitis. The patient did not relax, however, but became worse, and it was obvious

that she was going to die from something before the laboratory could give us a diagnosis. We still could not definitely rule out cerebellar abscess, and for this reason debated whether we should do a ventriculogram. The decision was finally made to do this test, and it was negative, leaving us with a third normal test.

Dr. Delp: Dr. Proud, I brought up the matter of the seemingly damaged petrous pyramid. I think you saw those films, and we discussed this with you. Do you have any thoughts about it at the moment?

Dr. G. O. Proud (otorhinolaryngologist): It has been some time since I have seen the films, but I thought at the time that they were equivocal.

Dr. Delp: Dr. Brackett, do you have any other thoughts about this patient now?

Dr. Brackett: We had evidence of a chronic meningitis and a history of chronic pulmonary infection. In reviewing her x-rays I thought that she did have rarefaction of the left petrous apex and, with negative cultures, I thought that she might have an extradural granuloma involving the fifth nerve in Meckel's cavity and partial compression of the left corticospinal tract.

Dr. Delp: You felt that there was significance to this complaint that the patient had had for four months before her death.

Dr. Brackett: Yes, sir.

Dr. Delp: Dr. Frenkel, will you please present the pathologist's report.

PATHOLOGY REPORT

Dr. Jacob K. Frenkel (pathologist): The culture for Histoplasma was probably erroneously reported to be positive. Dr. Weber took six cultures later, and all were negative. It is worth pointing out that her histoplasmin skin test had been positive ever since 1949, and that in 1949 her complement fixation titer had been 1:50. A culture for tubercle bacilli was reported positive in October 1952, with a moderate growth of acid-fast bacilli. However, three subsequent cultures were negative. The patient's tuberculin reaction was always negative. No Ghon lesion was found at autopsy.

The patient's primary disease was an allergic one. At autopsy we found chronic inflammation of the left maxillary sinus with ulcerations. There was edema, a little hemorrhage, numerous polymorphonuclear neutrophils, but no eosinophils at this time, as the patient had been taking cortisone.

On examination of the lungs we saw extensive bronchitis, some hypertrophy of the peribronchial musculature, patches of inflammation, and some emphysema. Many of the bronchi were outlined by thick, eosinophilic basement membranes, indicative of long-standing inflammation.

In the calvarium we found edema of the seventh

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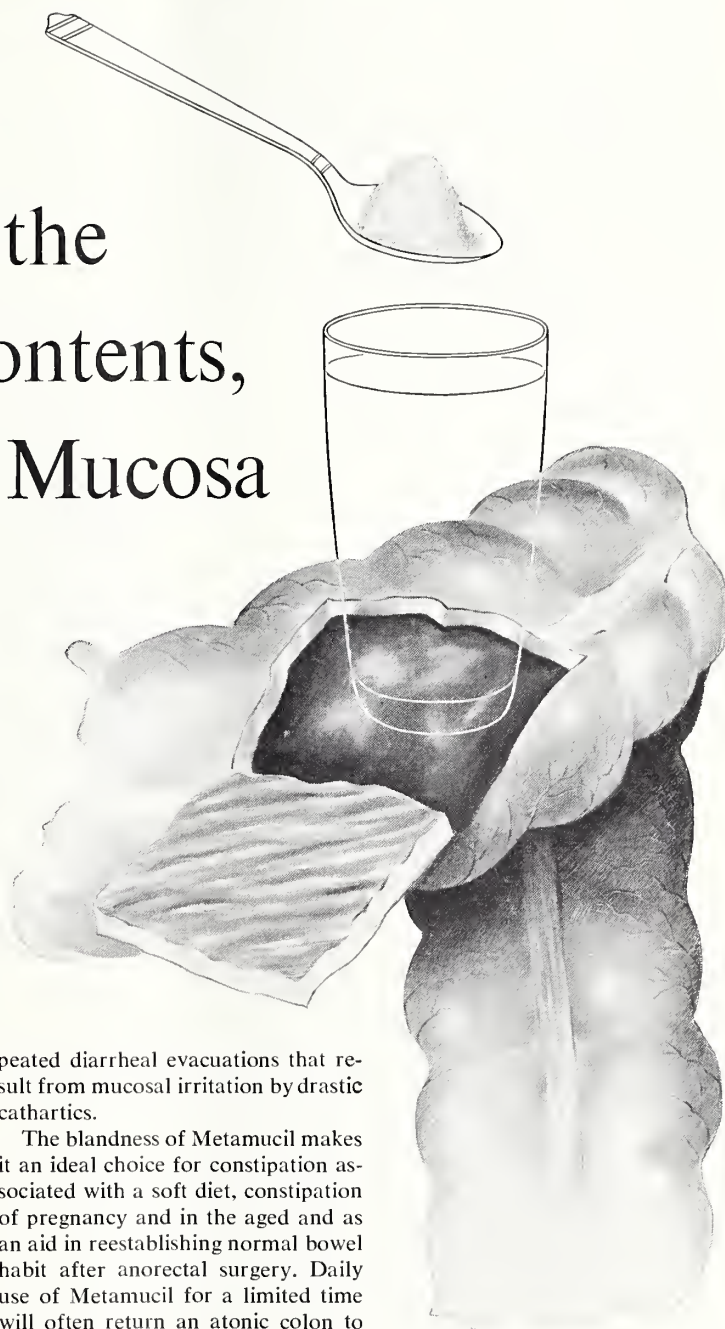
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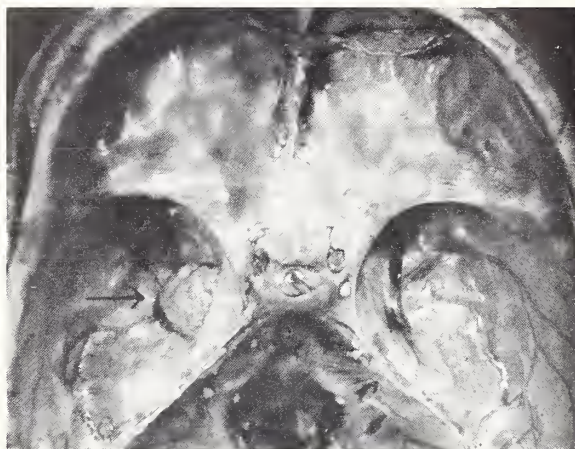


Figure 4. Gross photograph of granuloma from the petrous ridge.

nerve with loss of myelin and inflammation, but there was no evidence here to show what caused this process.

The patient had ventriculograms, and there was a certain amount of hemorrhage along the needle tracts.

A small tumor (2.5 x 2.0 x 1.5 cm.) was found anterior to the petrous ridge on the left side, as Dr. Brackett had expected. It was glistening and was both intradural and extradural (Figure 4). This tumor was made of chronic inflammatory cells, with giant cells and fibroblastic proliferation, a typical granuloma. Ovoid bodies and septate tubes were found which resembled fungi and stained appropriately with the periodic-acid-Schiff stain (Figure 5). Fungi and granulomatous inflammation were also present in the fifth nerve.

All of the vessels around the base of the brain were

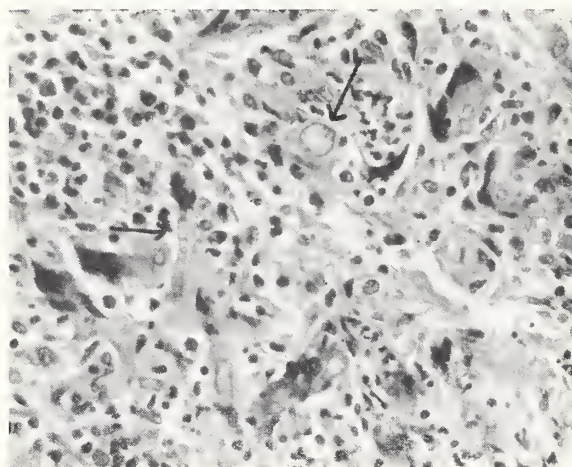


Figure 5. Granuloma from the petrous ridge, showing fungus spherules and hyphae (arrows), accompanied by microabscesses, fibroblastic and giant cell reaction, and by numerous plasma cells and lymphocytes. PASH. x 500.

involved to marked or moderate degrees (Figure 6). There was arteritis leading to thrombosis and to encephalomalacia of parts of the pons, resulting in death. Much inflammatory reaction was present in the subarachnoid space, together with fungal hyphae (Figure 6). These hyphae were septate, differentiating this fungus from *Mucor* which can give rise to similar lesions.^{1, 2}

Careful examination by Dr. Masahiro Chiga, who performed this autopsy, revealed three small nodules in the lungs. In one of these nodules, which was surrounded by a connective tissue capsule, he found a giant cell which contained fungi morphologically identical to those found in the brain (Figure 7). Both spherules and hyphae were seen.

Our concept of this process is that the fungus was inhaled, that at one time or another it became blood-borne and was carried to the meninges, and that a

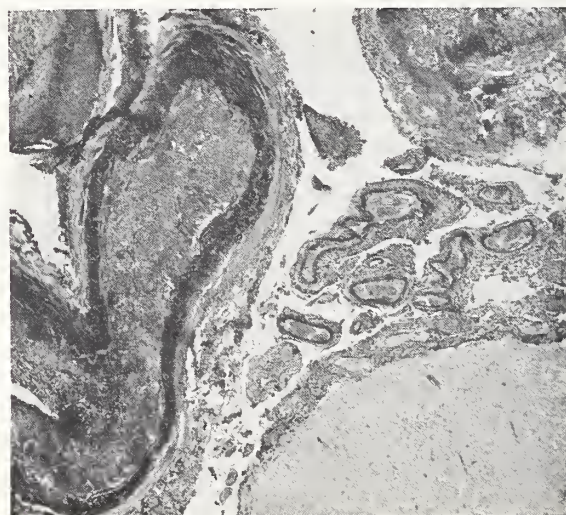


Figure 6. Meningitis and vasculitis with thrombosis of artery at base of pons. PASH. x 40.

granuloma developed there. It slowly enlarged and gave rise to basilar meningitis.

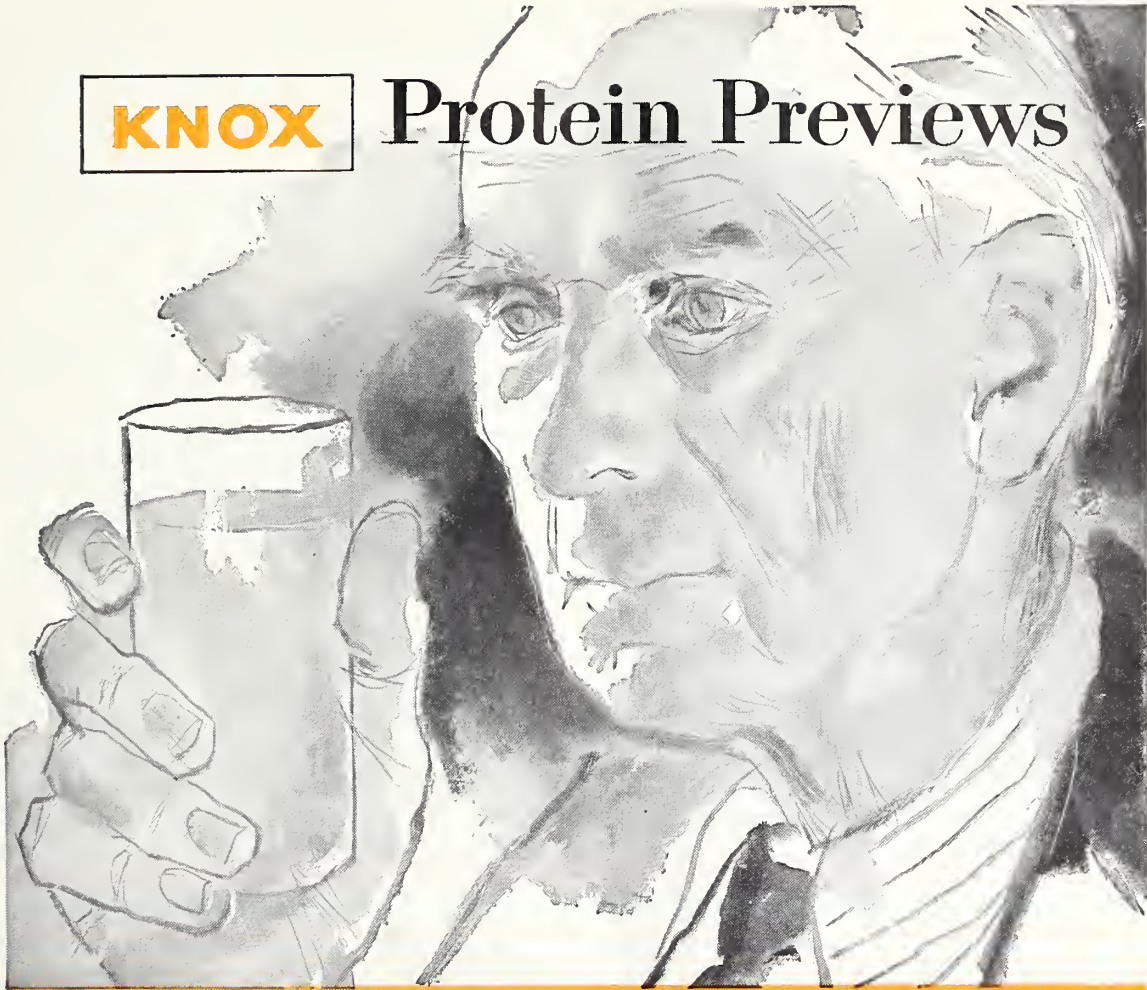
What are some of the factors that may predispose a patient to develop such lesions? We know that this patient took cortisone for a considerable period of time. I mention this merely as a possibility.

Dr. Alvar Werder has done some work on blastomycosis in mice which is illustrative of the degree of resistance-depression brought about by cortisone.⁴ He started out with two groups of 16 mice. After one month without treatment, 13 were still alive. After cortisone treatment for 15 days, only four of the other group of mice were alive, and at 30 days all had died. Cortisone is also known to reduce resistance of the host to other fungus infections.

A further possibility to be considered is the use of antibiotics. It has recently been shown¹ that antibiotics

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may predispose the host to fungal infections, not only by the mechanism of reducing bacterial infection and producing a more favorable environment for fungi, but also by their direct growth-stimulating effect. Hence, both host and microbial factors may be involved in making individuals more susceptible to fungal and other infections, particularly when the doses are large and the course of treatment is long.

It should be mentioned that attempts to grow the fungus were temporarily successful, but that no growth occurred on subculture. Hence we were unable to make a more exact etiologic diagnosis.

Dr. Delp: Dr. FitzPatrick, do you have any comments about this case?

Dr. Martin FitzPatrick (internist): Was there bronchiectasis in the left lung?

Dr. Frenkel: There was moderate bronchiectasis but only slight emphysema.

Dr. FitzPatrick: I think it is a fascinating case of a 44-year old woman who had bronchopulmonary allergy, complicated by infection, and ultimate death from the granuloma and meningitis. The vascular lesions which Dr. Frenkel showed are remarkable. We have seen similar lesions in patients with tuberculous meningitis. Recently, with chemotherapy, patients are not dying in the first few weeks; they may live for months and thus have time to develop end-arteritic and obliterative lesions and actually get degenerative changes in the brain.

Dr. Delp: Dr. Weber?

Dr. Robert W. Weber (internist): I saw this patient many times before her death. In 1952 she definitely had chronic pulmonary insufficiency and severe bronchial spasm which did not respond to medical therapy. She had severe bronchial spasm and was put on the only drug that would relieve it, cortisone. She took penicillin, broad spectrum antibiotics, and aerosol

penicillin intermittently. Most of these could have been factors in her death. The physicians took a calculated risk when these medications were prescribed. When they were started the patient had been an invalid, then for two and a half years she was active and was able to continue her work. This is one of the complications that we see with increasing frequency; with prolonged use of corticoids and antibiotics, these complications are going to occur.

PATHOLOGICAL ANATOMICAL DIAGNOSIS

Chronic nonspecific sinusitis of ethmoid, sphenoid, and maxillary sinuses (history of sinusitis for a long time before death).

Bronchiectasis involving all lobes of both lungs, moderate (history of asthma and recurrent respiratory infection during eight years before death).

Emphysema of both lungs, slight.

Fibrous adhesions of both lungs to the parietal pleura, moderate.

Hypertrophy and dilatation of the heart, weight 300 grams.

Old fibrocalcified mycotic granulomas in the left lung, with fungi described below.

Partially calcified hilar lymph nodes.

Chronic active mycotic infection involving the meninges, the vessels of the brain stem and base of the brain, the fifth and seventh cranial nerve, with the formation of a circumscribed granuloma (2.5 x 2 x 1.5 cm.) anterior to the left petrous ridge, containing both hyphae and spores of an unidentified fungus (morphologically atypical of the well-known pathogens, culture unsuccessful). (History of numbness of the left side of face three months before death, headache, lethargy, right-sided weakness, coma, and pleocytosis and increased protein content of spinal fluid during two weeks before death.)

Encephalomalacia involving the pons, moderate, secondary to mycotic vasculitis.

Edema of the brain, weight 1500 grams.

Recent surgical incisions in the head, burr holes in the parietal bones, and needle tracts in both frontal lobes (history of ventriculography seven days before death).

Acute passive congestion of the lungs, liver, kidney, spleen, and gastrointestinal tract, slight.

Atelectasis of the lower lobe of the left lung, slight.

Depletion of the lipid of the adrenal cortices, slight (history of cortisone administration for one week before death).

Puncture wounds and ecchymoses in both gluteal regions and antecubital fossae (history of injections and venoclyses during nine days before death).

Vacuolation of the basophilic cells of the pituitary gland, slight.

Cholelithiasis, a pigment stone.

Healed pararectal linear wound in the right lower

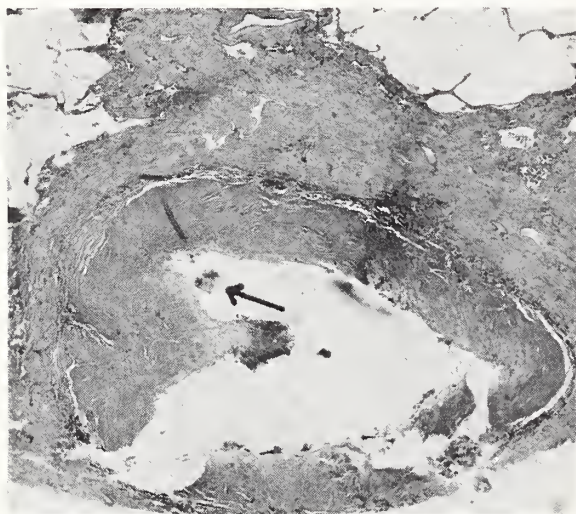


Figure 7. Pulmonary nodule with giant cell (arrow) containing fungus. PASH. x 40.



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quadrant of the abdomen and absence of the appendix (history of appendectomy 16 years before death).

Arteriosclerosis of the aorta, and coronary, cerebral, and pulmonary arteries, slight.

SUMMARY

Dr. Delp: Through the control of bacterial infection and bronchospasm by the use of steroids and antibiotics, a pulmonary invalid of many years was rehabilitated. However, effective as this regimen was in design, the total plan failed in permitting and even fostering the over-growth of a fungus infection, against which there was insufficient defense. Much is yet to be learned of the laws of nature which control infections.

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Clinical Conference in Kansas City

Fifteen nationally known speakers will participate in the 34th annual conference of the Kansas City Southwest Clinical Society, September 24-27. A list of participants will be found in an advertisement on Page 595 of this issue. The program will include lectures, panel discussions, a clinicopathological conference, color television, and daily luncheon quiz periods.

Entertainment on Tuesday evening will be presented in the Pla-Mor and will include a social hour, a buffet supper, a pop concert by 50 members of the Kansas City Philharmonic Orchestra, and two hours of dancing to a 12-piece band.

The complete program for the conference is being published in the September issue of the *Kansas City Medical Journal*.

Medical Assistants to Meet

Medical assistants of the nation will gather in Milwaukee on October 26 for a three-day meeting designed to effect organization of the American Association of Medical Assistants. The first meeting of the group was held last fall in Kansas City, at the

invitation of the Kansas Medical Assistants' Society and with representatives of the Kansas Medical Society in attendance.

Most of this year's session will be devoted to business meetings for the entire group, with Sunday set aside for directors' and committee meetings. A Milwaukee brewery will provide entertainment and a buffet supper on Friday evening. A luncheon session on Saturday will include a program with the Rev. Joseph Holleran, director of the Family Living Program of Marquette University, as speaker. At the banquet Saturday evening, following a social hour, Dr. J. E. Manning, Saginaw, Michigan, will speak on "Progress of Research on Medical Assistants' Groups" and "The Medical Assistant of Today."

Two Kansans hold positions of responsibility in the temporary organization, Miss Maxine Williams as chairman and Mrs. Carmen Kline as treasurer. With a secretary and one representative from each of 13 states, they form the present governing body.

A number of Kansas medical assistants will attend the Milwaukee meeting. Registration blanks may be secured from Miss Maxine Williams, 807 Huron Building, Kansas City, Kansas.

A.A.G.P. Building in Kansas City

More than 400 physicians were present at the formal dedication of the new American Academy of General Practice headquarters building in Kansas City on September 1. The four-story building at the corner of Volker and Brookside Boulevards will house the Academy staff and the editorial and business offices of *GP* magazine. The organization, founded in 1947, now has 21,000 members and a staff of 64.

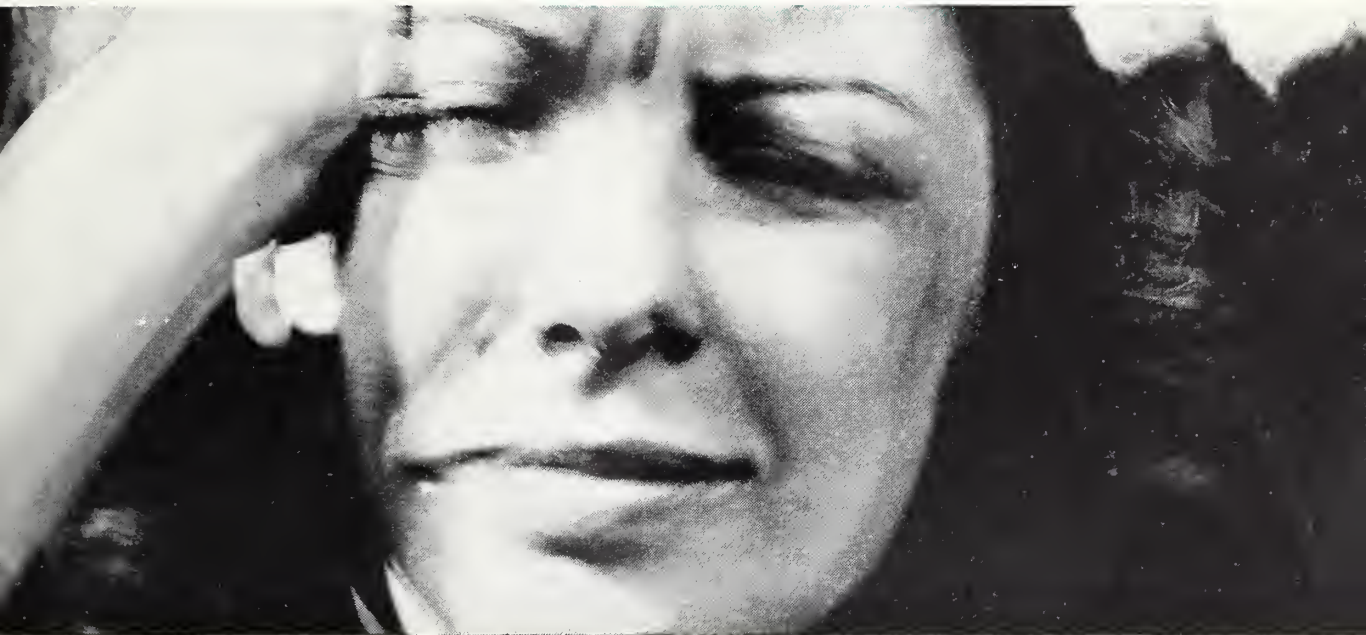
Oklahoma City Clinical Society Conference

The 26th annual conference of the Oklahoma City Clinical Society will be held this year from October 22 through October 25. A large enrollment is expected, and Oklahoma City is becoming increasingly popular as a convention city, now being rated third in the nation.

Sixteen speakers will present the program. In addition to general assemblies, there will be specialty lectures, a new feature this year, and daily luncheon question and answer sessions and a clinical pathologic conference. Entertainment will include dinner meetings, a dinner dance, and specialty group affairs.

All physicians who are members of their county medical societies are invited to attend. The American Academy of General Practice approves the conference for credit under Category 1.

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1. Fazekas, J.F., et al.: J.A.M.A. **161**:46 (May 5) 1956. 2. Mitchell, E.H.: J.A.M.A. **161**:44 (May 5) 1956.

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PHYSICIANS' ACTIVITIES

Dr. Dean Miller, who recently completed a residency at Research Hospital, Kansas City, Missouri, is now practicing in Topeka in association with **Dr. Guy Finney**, **Dr. Homer L. Hiebert**, and **Dr. Willis L. Beller**. Dr. Miller, who is a diplomate of the American Board of Radiology and Nuclear Medicine, was graduated from the University of Kansas School of Medicine in 1948.

The Nelson Clinic, Manhattan, announces that **Dr. W. Graham Calkins** is now a member of its staff. Dr. Calkins is a graduate of the University of Michigan School of Medicine. After spending two years in the Navy, he went to the University of Kansas Medical Center for a residency in internal medicine.

Dr. Roger F. Eakins, who has been practicing in Goodland, moved to Colorado last month to begin practice in Denver.

A feature story in the *Bonner Springs Chieftain* recently was devoted to **Dr. Karl M. Rottluff**, who was honored by the Rotary Club for 20 years of perfect attendance.

Dr. George E. Burket, Jr., has returned to his practice in Kingman after having spent a year in Boston as a surgical resident at the Massachusetts General Hospital.

Dr. J. Gordon Claypool, who will complete a research fellowship at the University of Kansas Medical Center in December, recently became a diplomate of the American Board of Internal Medicine. He formerly practiced in Howard.

A feature story in the *Wichita Eagle* on July 20 paid tribute to **Dr. Martin Hagan**, who has completed 50 years of practice. Three of his sons are also Wichita physicians, **Dr. Condon T. Hagan**, **Dr. Daniel J. Hagan**, and **Dr. Francis J. Hagan**.

Dr. A. E. Bair, who has recently been on the staff of the Veterans Administration Hospital in Wichita, has returned to Independence and is resuming his practice there.

The Mission Clinic announces that **Dr. Richard D. Blim** is now a member of its staff. Dr. Blim, a graduate of the University of Kansas School of Medicine, recently completed a residency in pediatrics at the Medical Center.

Dr. Herbert W. Jury, Claflin, who has been in practice 53 years, was the subject of a feature story in the *Claflin Clarion* on July 10.

Dr. Conrad M. Barnes, Seneca, and **Dr. John A. Grove**, Newton, are members of the executive committee of the newly organized Kansas Citizens Safety Council.

DEATH NOTICES

WALTER ETNA MCKINLEY, M.D.

Dr. W. E. McKinley, 88, an honorary member of the Miami County Medical Society, died at his home in Gardner on July 19. A graduate of the College of Physicians and Surgeons, Keokuk, Iowa, in 1887, he came to Kansas in 1920 and practiced in Grant City and Jewell until 1942, then joined the staff of the Osawatimie State Hospital. He retired to Gardner two years ago. He was a member of the American Psychiatric Association.

JOHN MERRITT MCGREW, M.D.

Dr. J. M. McGrew, 56, Wellington, died at a Wichita Hospital on July 25. He was an active member of the Tri-County Medical Society and was serving as its president at the time of his death. He was a graduate of the University of Kansas School of Medicine, class of 1927, and specialized in the practice of obstetrics and gynecology.

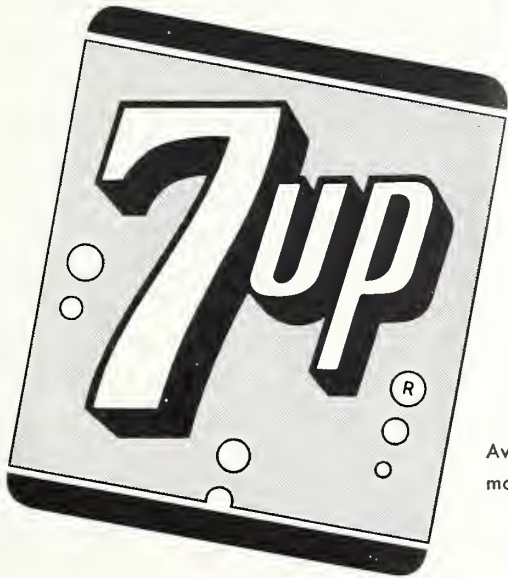
DONALD L. WILLIAMS, M.D.

Dr. D. L. Williams, 32, Garden City physician and Finney County health officer, died at a Greensburg hospital on July 25 of injuries suffered in a car accident early that morning. A graduate of the University of Kansas School of Medicine, Dr. Williams had practiced in Garden City since 1953 and was an active member of the Finney County Medical Society.

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Chosen as "Man of the Week" in Emporia on July 21 was **Dr. C. H. Munger**, Lyon County health officer for 24 years.

Dr. Floyd E. Muck, who has practiced at the Hertzler Clinic in Halstead since returning from service as a medical missionary in the Belgian Congo, has moved to Caney and is now in practice there.

Dr. James E. Hodgson, Downs, is serving as health officer for Osborne County while **Dr. James E. Henshall**, Osborne, is away for two months touring Europe.

An isotope laboratory was set up at Riley County Hospital, Manhattan, recently by **Dr. Roger Wallace**. The laboratory has been certified for radioiodine uptake diagnostic studies and therapy.

Dr. Thomas P. Butcher, Emporia, announces that **Dr. Richard P. Schellinger** is now associated with him in surgical practice. Dr. Schellinger, a graduate of the University of Nebraska School of Medicine, had a two-year surgical residency in St. Luke's Hospital, Denver, spent a year in Alaska as an Air Force surgeon, completed his surgical residency in Wichita, and then spent two years there as assistant chief of surgery at the Veterans Administration Hospital.

Feature stories about **Dr. Joseph A. Poppen** were published in a number of Kansas newspapers last month on the occasion of his 50th anniversary in the practice of medicine. His home community, Burr Oak, honored him with a celebration on July 31.

Dr. E. Grey Dimond, professor of medicine and chairman of the department at the University of Kansas Medical Center, has been granted sabbatical leave from July 1 to January 1 to travel abroad on a Paul Dudley White Traveling Scholarship. For a 10-week period he will be a Fulbright visiting professor of cardiology at the University of Utrecht, Netherlands.

Dr. William F. Splichal, who has practiced in Belleville since 1931, recently opened an office in Manhattan for general practice.

"Parsonian of the Week" was the title conferred on **Dr. Charles F. Henderson** recently. A story

about him was published in the *Parsons Sun*, and his photograph was displayed in an honor spot in the lobby of the Parsonian Hotel.

Dr. A. N. Lemoine, Jr., professor of ophthalmology at the University of Kansas Medical Center, lectured on applied anatomy of the eye and orbit at the Lancaster Course in Ophthalmology at Waterville, Maine, in July.

Dr. William Rottersman, formerly of the Menninger Foundation, Topeka, has entered private practice in Atlanta, Georgia.

A surgical practice has been begun in Kansas City by **Dr. William E. Burger**, a 1951 graduate of Creighton University School of Medicine who recently completed a four-year residency at the University of Kansas Medical Center.

Dr. John W. Turner, Garden City, has been named health officer of Finney County.

Dr. Henry W. Lane, director of the city-county health department in Kansas City, left that position on September 1 to become health officer in charge of the West Seattle-King County, Washington, district.

Having completed a three-year surgical residency at St. Joseph's Hospital, Kansas City, **Dr. William Zimmerman** has now begun private practice in Fort Scott. He is a graduate of Creighton University School of Medicine and a veteran of four and a half years in the Army.

Dr. Tom R. Hamilton, professor and chairman of microbiology at the University of Kansas Medical Center, has been elected to membership in the American Rheumatism Association. He also received a scholarship from Massachusetts Institute of Technology to cover partial cost of a course in Modern Research Methods in Biology and Medicine at Cambridge this summer.

Dr. John R. Shumway, who has been in practice for more than 50 years, mostly in Pleasanton, has announced his retirement. **Dr. Bill Justus**, a graduate of the University of Kansas School of Medicine who interned in Houston, Texas, is taking over Dr. Shumway's practice.

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Hypophosphatemic Rickets

Description and Case Reports of Renal Tubular Form of This Deficiency Disease

R. E. PETERSON, M.D., *Boston*

Infantile rickets is a deficiency disease due to a lack of vitamin D and is characterized by a disturbance of the calcium and phosphorus equilibrium in the blood. Effects of the disease are seen in the skeleton. The incidence has fallen considerably in the past 20 years because of the use of cod liver oil and other sources of vitamin D. It is one of the outstanding accomplishments of preventive pediatrics that florid rickets is now almost a curiosity and mild rickets comparatively rare.²²

It has long been known that some cases of infantile rickets do not respond to the usual doses of vitamin D, and that rickets can develop in children receiving the usual prophylactic doses of vitamin D. It was not until 1937 that Albright described a severe vitamin-resistant type of rickets. It was pointed out that this disease differs from infantile rickets only by its severity, its failure to respond to the usual treatment, and its response to massive doses of vitamin D.

The disease is characterized by short stature and the usual physical, pathological, and roentgenological findings of florid rickets. Blood studies show decreased inorganic phosphorus, normal or low serum calcium, and a variable alkaline phosphatase. Along with these findings, there is no evidence of kidney, liver, or gastrointestinal disease. Neither is there evidence of any other renal disease.¹

While the above condition has been established as a clinical entity and is usually called vitamin D resistant rickets, the term may be misleading. The fact that large doses of vitamin D are required to arrest the disease does not necessarily imply that the actual metabolic defect is a resistance to this vitamin. The purpose of this paper will be to discuss the pathologic changes in rickets and the role of calcium, phosphorus, and parathormone in bone metabolism. The clinical picture will be presented along with illustrative cases. The mechanism of the disease will be discussed, and the term hypophosphatemic renal tubular rickets is advanced as more descriptive of the metabolic defect than the term ordinarily used.

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Peterson is now serving his internship at Boston City Hospital.

PATHOLOGY OF RICKETS

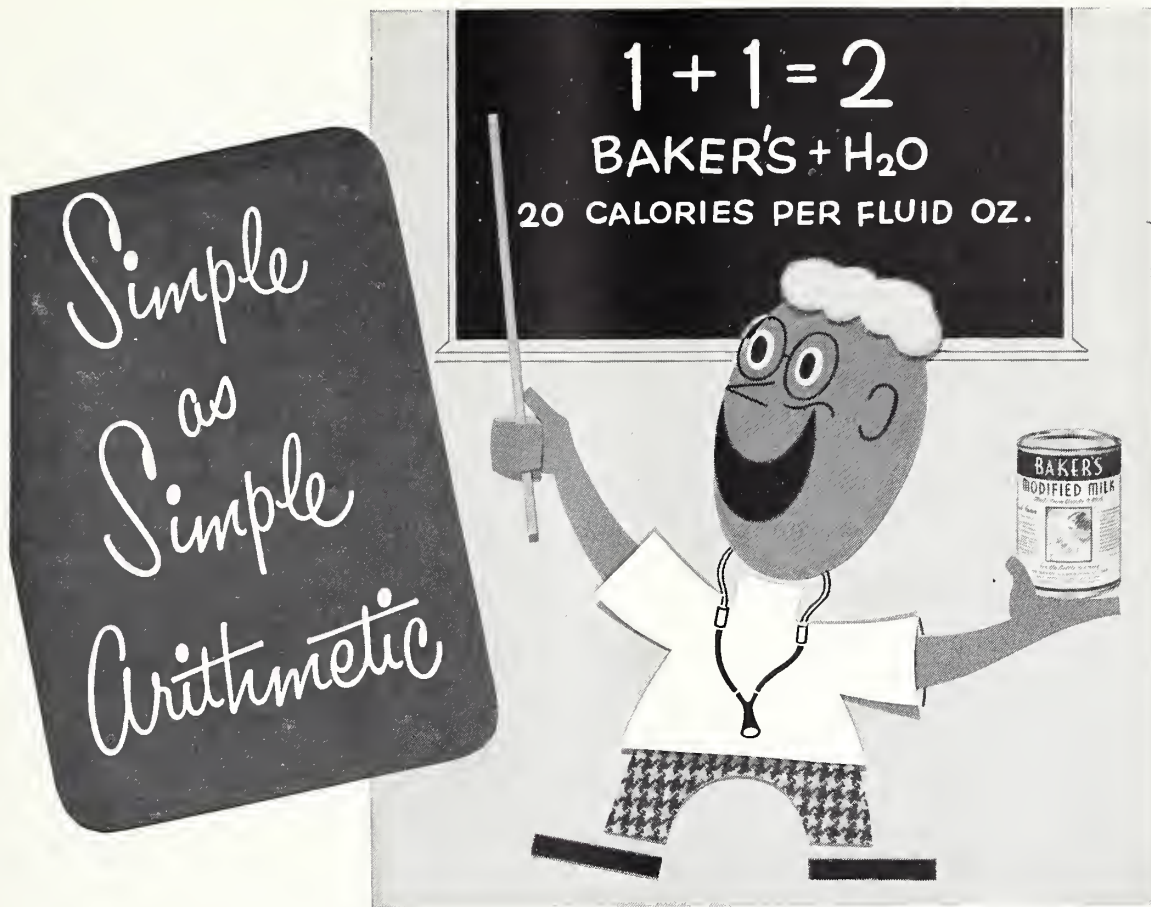
The pathologic changes of rickets are most prominent in those regions where the bone is growing rapidly. The region of the metaphysis is enlarged and easily fractured. The junction between cartilage and bone is irregular, and there are numerous vascularized foci extending into the cartilage from the primitive marrow. The zone of calcified cartilage is entirely absent. In the absence of calcification, osteoid is laid down in increased quantities, resulting in poor quality bone which soon becomes deformed.

Growth in length of the long bones is retarded since this type of growth takes place at the epiphyses. Osteoblasts brought in by capillaries normally build new bone over a calcified matrix. But in this disease capillary penetration is arrested by the excessive amount of osteoid, and the proliferating cartilage cells are not destroyed. This results in the irregular, shortened, expanded "intermediate zone" which is characteristic of rickets. Shortening of the bone and thickening of the epiphyseal area result.¹⁹

The histologic changes include increased width of the epiphyseal cartilage, failure of epiphyseal cartilage to be reabsorbed, compression of chondrocytes, formation of osteoid tissue, and irregular capillary invasion of cartilage. The defect in rickets is seen to be the lack of provisional calcification and the absence of this necessary zone for bone formation. This is traceable to a deficiency of calcium and phosphate in the area.²¹

CALCIUM METABOLISM

Calcium, one of the two major inorganic constituents of bone, exists in nature in both organic and inorganic form. It is absorbed in the upper small bowel. Absorption is aided by gastric acid which helps maintain the proper hydrogen ion concentration for calcium salt solubility.⁴ This calcium-phosphorus ratio of the ingested food is more important than the absolute amount of either element as long as there is not a deficiency. Excess phosphorus will interfere with calcium absorption by forming relatively insoluble calcium phosphate. Conversely, on a low phosphorus diet, excess calcium interferes with ade-



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quate phosphorus utilization. This leads to the production of low-phosphorus rickets, which will be discussed later.²⁵

Vitamin D causes increased calcium retention in rachitic infants, resulting in decreased fecal excretion and a negligible increase in urine. In normal adults, large doses of the vitamin initially decrease the proportion of calcium in the urine, but the action is reversed in a few days and the main effect is to increase significantly the proportion of urinary calcium without altering the total excretion. It is, therefore, clear that this vitamin promotes the absorption of calcium across the intestinal wall.³

In protein-free fluids such as cerebrospinal fluid, calcium is mostly in the ionized form. In serum, calcium combines with protein and represents an equilibrium between protein, total calcium, and calcium ions; this equilibrium may be expressed by a mass law equation.¹¹

Observations on purified serum proteins and on the response of frog heart muscle to solutions of known protein-containing fluids indicate that protein is the only significant calcium-binding substance in human serum.¹⁸ Studies on radioactive calcium suggest that there is a labile calcium fraction in bone amounting to approximately 15 per cent of the total bone calcium. This is at equilibrium with serum calcium and declines as calcium is excreted in the urine and the serum level falls. Ion exchange is probably the important factor in this phenomenon. The labile calcium fraction may represent exchangeable calcium on the surface of the bone crystals.²⁴

A survey of available data has appeared to substantiate the view that parathormone exerts its effects on calcium metabolism by a direct action on the bones. Selye has shown that the hormone acts by stimulating the formation and activity of the osteoclasts of bone with the result that calcium and phosphorus are mobilized in increased quantities from the skeletal structure.⁶

It is likewise evident that parathormone does not interfere with calcium reabsorption by the renal tubules. Indeed there is greater reabsorption of calcium in the hyperparathyroid state than under normal conditions. This increased reabsorption of calcium must result from the mass action phenomenon that the renal tubules are presented with greatly increased quantities of calcium in the glomerular filtrate.¹³

PHOSPHORUS METABOLISM

Phosphorus, which is a non-metal, does not occur free in nature but is found in the form of complex mineral compounds and in foods as organic phosphates. The complex organic phosphorus-containing compounds which are ingested must be broken down

enzymatically by the pancreatic juices and succus entericus in order to be absorbed in the form of soluble inorganic phosphate in the small intestine. It is then transported across the cell membrane in combination with calcium.

Phosphorus absorption is also dependent upon vitamin D. It is probable that phosphate can be absorbed as an anion with sodium, but ordinarily it is combined in some form of a complex with calcium. Vitamin D promotes the absorption of this complex.¹⁴ Other factors of phosphorus absorption are also related to calcium. A large excess of calcium will interfere with the absorption of both elements. This occurs because the excess calcium will combine with most of the phosphorus and be discharged in the stool while some of the surplus calcium will be absorbed in the form of carbonates, chlorides, and hydroxides. Conversely, if inadequate calcium intake occurs, there is a relative excess of phosphorus in the gastrointestinal tract which will result in excess output of both in the stool.

An adequate level of phosphorus along with calcium and alkaline phosphatase is necessary for the calcification of osteoid and the formation of bone. Yendt and his group studying *in vitro* calcification of rachitic rat cartilage found that the product of the serum calcium and phosphorus levels must be above a certain figure in order to effect calcification. Below this level, rachitic changes would persist.²⁷

Regulation of phosphorus level is then important in bone formation.

Phosphorus is excreted in the urine principally as monosodium and disodium phosphates. It is filtered through the glomeruli in direct proportion to the serum level. It is then reabsorbed in the proximal renal tubules. The role of parathormone in the regulation of serum phosphorus level is controversial and deserves consideration at this point.

Albright has proposed the theory that parathormone, by increasing the urinary loss of phosphate, leads to hypophosphatemia. Following this reduction in phosphate level, the serum becomes unsaturated with respect to calcium phosphate, and calcium then enters the serum from the gastrointestinal tract and the skeleton in increased amounts. Hypercalcemia and hyperphosphaturia result. Ellsworth maintains that the hyperphosphaturia which follows parathormone is caused by a lowering of the renal threshold for phosphorus. These investigators have presented clinical and experimental evidence in favor of this view.¹³

Later, Collip et al., to determine the site of the action of parathormone, carried out experiments on rats. They injected nephrectomized rats with parathormone and later sacrificed them. The lower ends

Meat...

and Its Place in the Diet in Congestive Cardiac Failure

Meat has an appropriate place in the moderate-protein, low-sodium, acid-ash diet advocated in the dietary management of patients with congestive cardiac failure.¹ When extreme sodium restriction is necessary, the meat allowance is regulated accordingly.

Lean meat allows maintenance of a positive nitrogen balance without excessive protein intake, because its amino acids match the quantity and proportions needed for tissue synthesis and repair.^{2,3} In the fresh state as purchased it supplies only small amounts of sodium ranging from approximately 50 to 100 mg. per 100 grams. Due to its acid-ash composition (equivalent to 4 to 38 ml. of normal acid per 100 grams of meat) it may facilitate diuresis.¹

In addition to these important features, meat contributes valuable nutritional factors by virtue of its generous supply of high quality protein, B vitamins, and essential minerals—iron, phosphorus, potassium, and magnesium.

Easy digestibility, a prime requisite of foods eaten by the patient with congestive cardiac failure, is another outstanding quality of meat.

1. Odel, H. M.: Nutrition in Cardiovascular Disease, in Wohl, M. G., and Goodhart, R. S.: *Modern Nutrition in Health and Disease*, Dietotherapy, Philadelphia, Lea & Febiger, 1955, p. 709.
2. Berg, C. P.: Utilization of Protein, *J. Agr. & Food Chem.* 3:575 (July) 1955.
3. Best, C. H., and Taylor, N. B.: *The Physiological Basis of Medical Practice*, ed. 6, Baltimore, Williams & Wilkins, 1955, p. 638.

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of the femurs all showed signs of osteoclastic bone reabsorption. From this they concluded that the action of parathormone on the bones is independent of any direct influence it may have on the renal threshold for phosphates.⁶

Fay studied phosphate-creatinine clearance ratios over a wide range of plasma phosphate concentration in normal, parathyroidectomized, and parathormone-treated dogs. He reported no significant differences in the three groups and concluded that there is no apparent alteration in the clearance of phosphate by the kidney after parathyroidectomy or administration of parathormone.¹⁰

Jahan and Pitts studied renal tubular reabsorption of phosphate under controlled conditions of parathyroid activity and demonstrated that parathormone causes no appreciable depression of serum phosphate level and does not interfere significantly with the capacity of the renal tubules to reabsorb phosphate. Their experimental methods have been questioned, but their conclusions are that the action of parathormone on the metabolism of calcium is independent of any direct influence it may have on the renal threshold for phosphate.¹³

CLINICAL PICTURE

The children who present themselves with refractory rickets will be of short stature because of retarded epiphyseal growth. The epiphyses will be enlarged and prominent, and there will be bowing of the long bones, particularly in the lower extremity. Often a family history of rickets can be elicited. Laboratory findings will consistently be a normal serum calcium and a low serum phosphorus. Roentgenographically, in addition to the deformities noted above, there will be widening of the epiphyseal lines with fuzziness at the metaphyseal end of the epiphyseal plate. The pathologic picture is identical with that previously described for infantile rickets.

Pederson and McCarrol reported on 25 such patients who have been treated in St. Louis. All had a history of rickets beginning in infancy and each had been treated with vitamin D, but in spite of this, florid rickets appeared with the presence of severe deformity in the lower extremities. Sixteen of the 25 patients fell into 10 family groups, and all were of below average stature. In each instance the presence and persistence of deformities had necessitated one or more osteotomies in the lower extremities. The serum calcium was normal or below average in all cases. The serum phosphorus was below normal in all but two cases. The alkaline phosphatase varied from normal to elevated. The Sulkowitch test was negative to a bare trace, as opposed to a one to two plus for normal. Other laboratory tests were normal.

There was no evidence of acidosis, disturbed carbohydrate metabolism, or liver disease. The rickets responded only after massive doses of vitamin D, the amount varying with each case. Once healing had begun, the dose could be reduced, but a maintenance dose was necessary.

It was felt that this disease is more common than previously reported and actually represents a common form of dwarfism. The diagnosis can be made by urine analysis and blood chemistry studies including serum calcium and phosphorus.²³

Myerson presented a case similar to the preceding which showed a low-phosphorus refractory type of rickets which was resistant to vitamin D therapy. He attributed it to faulty renal tubular absorption of phosphate and classified it as a variant to the Fanconi syndrome.²⁰

McCune described refractory rickets of the low-phosphorus type in identical twins.¹⁷ Later he described 30 cases in which rickets appeared at the end of the first year of life and persisted despite standard vitamin D therapy. These patients showed a normal serum calcium and a low serum phosphorus. The clinical picture was similar to that previously described.¹⁶

CASE REPORTS

The following patients, treated at Children's Mercy Hospital in Kansas City, Missouri, are presented as examples of those suffering hypophosphatemic renal tubular rickets:

Case 40917, R. A. R. This 19-month-old Mexican male was admitted to Children's Mercy Hospital on September 10, 1951. He had marked "bow legs" which had been present from birth and which had become more bowed while he was receiving the usual dosage of cod liver oil. His older sister had had bow legs as an infant, but they had since straightened on cod liver oil therapy.

Physical examination revealed a well developed, well nourished Mexican male appearing in good general health, but somewhat thin. The only abnormality noted was a marked bilateral genu varum with lateral ligament instability.

X-ray films revealed increased density in the region of the epiphyseal plate on both distal femurs and the proximal tibiae. There was a slight increase in density about the margins of the secondary centers of ossification in the epiphyses at the proximal tibiae.

Laboratory studies: hemoglobin 8.5 g., red blood count 3,770,000, white blood count 12,300, normal differential, urinalysis normal, non-protein nitrogen 48.5 mg. per cent, thymol turbidity negative, fasting blood sugar 110 mg. per cent, globulin 2.2 g., albumin 5.5 g.



From the Literature

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- "... reduction of the blood pressure may be achieved in substantially all forms of hypertension."³
- "... possible in most patients to get a good control over blood pressure levels with comparatively few side-effects."⁴
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1. Moser, M.: New York State J. Med. 55:1999 (July 15) 1955.
2. Agrest, A., and Hoobler, S.W.: J.A.M.A. 157:999 (March 19) 1955.
3. Smirk, F.H.: Am. J. Med. 17:839 (Dec.) 1954.
4. Smirk, F.H., and McQueen, E.G.: J. Chron. Dis. 1:516 (May) 1955.
5. Waldman, S., and Pelner, L.: Am. J. M. Sc. 231:140 (Feb.) 1956.

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Date	Calcium	Phosphorus	Alkaline Phosphatase	Sulkowitch
9-11-51	10.7mg.%	3.1mg.%	9.2 Bod. U.	reduced
9-28-51	10.2	2.8	2.2
10- 9-51	9.5	3.6	3.2	normal
10-26-51	9.4	3.4	3.3	sl. in- creased
11-12-51	12.8	2.5	..	increased
11-27-51	13.9	2.1	..	normal
12-14-51	16.2	1.65	2.35	normal

Hospital course: The patient was placed in a spica cast and treated with 3,000 units of vitamin D daily for 45 days without improvement. He was then given 200,000 units of vitamin D for 15 days, when the dosage was reduced to 100,000 units daily for the same period of time. At the end of the month of therapy, his serum calcium and phosphorus levels were not improved, as often happens, but he was clinically improved. His legs were straighter and the lateral ligaments were tight. His cast was removed and he was discharged on a maintenance dose of 12,000 units of vitamin D daily.

Six months later it was noted that the genu varum was still marked. Corrective wedges were placed in his shoes at this time. One year later it was noted that the legs were straightening nicely. There has been no recurrence of active rickets up to the present.

Case 50502, N. J. S. This three-year-old white female was admitted to Children's Mercy Hospital on November 17, 1954 and again on July 22, 1955. She had had rickets for one year, and the disease was progressively growing worse. She had received cod liver oil until age two. Her mother had had rickets during childhood. Her sister was also in the hospital for rickets (see next case).

Physical examination revealed a white female of average height and weight. Findings were limited to the skeletal system. Wrist epiphyses were enlarged, legs showed genu varum, enlargement below the knees, bowing of the femurs, and coxa vera. An x-ray on November 27, 1954, revealed anterior bowing of femur and tibia and bilateral knock-knees. There was flaring of the epiphyses at the distal radius and ulna. Trabeculations were increased throughout with generalized zone demineralization. The impression was active rickets.

Re-examination on January 2, 1955, showed flaring of the epiphyses with irregularity of the margins, but these rachitic changes were not as pronounced as before. Bone mineralization had improved. The bowing of the femur was unchanged.

The lower extremity deformity, examined on February 24, 1955, was essentially unchanged. The degree of mineralization was approximately the same as the last examination. Further examination on July 2, 1955, presented the same picture.

Laboratory studies: hemoglobin 8.5 g.; red blood

count 4,250,000; white blood count 8,080; normal differential, urine negative.

Date	Calcium	Phosphorus	Alkaline Phosphatase
11-18-54	9.1mg.%	4.3mg.%	2.8 K-A units
7-22-55	11.5	2.8	7.1 Bodansky units

Hospital course: During her first admission she was treated with 200,000 units of vitamin D daily for one month with clinical and roentgenological improvement as noted. She was dismissed on 5,000 units of vitamin D per day to be followed as an outpatient. Her second admission was for chicken pox. At this time the calcium and phosphorus determinations were more abnormal than formerly. She was placed in braces and again dismissed on the same maintenance dosage of vitamin D. The disease was arrested during the first hospital stay, but her serum changes persist months later while she is on maintenance therapy.

Case 50593, D. M. S. This seven-year-old white female, the sister of the previous patient, was admitted to Children's Mercy Hospital for varying periods in 1950, 1953, and 1954. She had had rickets since she started to walk, probably since birth. Her legs continued to bow in spite of vitamin D therapy.

Physical examination showed marked genu valgum, rachitic beads at the costochondral junction, and bowing of the tibia and femur.

X-ray films showed changes of rickets consistent with the physical findings. After her course of treatment, films showed the same improvement as was previously described for her sister.

Hospital course: She was treated and improved on 50,000 units of vitamin D for 16 days. A left supracondylar wedge osteotomy was done for previous deformity. She was placed in braces, and her maintenance dose of vitamin D was set at 6,000 units per day. When last seen, in 1955, she was doing well but was still in braces.

Unfortunately, calcium and phosphorus determinations were not done in this case. Other laboratory work was within normal limits. There was no evidence of other disease. The clinical picture was so similar to that of the patient's sister that we include this in spite of the lack of laboratory evidence of a low phosphorus.

DISCUSSION

In presenting these cases, we are not attempting to establish this type of vitamin-resistant rickets as a disease entity, since that has already been done,^{1, 16, 17, 23} but rather to illustrate the disease process in detail. These cases fit the criteria for the disease previously described and together point out the facets of the disease usually seen. Instead, we will discuss the experimental production of hypophos-

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phatemic rickets and present evidence that this is a disease of the renal tubule.

EXPERIMENTAL RICKETS

McCollum and Simmonds were able to produce a pathologic condition in the rat similar to human rickets through diet alone. They induced rickets by means of a ration deficient in phosphorus and fat-soluble vitamin A, and in which calcium was present in a ratio considerably higher than the calcium-phosphate ratio which is optimal for calcification. They concluded that a specific disproportion of the calcium-phosphate ration, i.e. the calcium high, the phosphate low, was a factor in production of rickets.¹⁵

Using rats fed purified diets extremely low in phosphorus, but adequate in all other essential nutrients, Coleman produced pathological and histologic changes consistent with the picture seen in human rickets, described earlier in this paper.⁵

Day and McCollum reported on mineral metabolism in animals as follows: The loss of calcium was precipitous during the first two weeks, almost two-fifths of the total loss occurring during that interval. Thereafter the rate of loss diminished. Meanwhile control rats were retaining the administered calcium.

The phosphorus metabolism was also striking. The deficient animals lost phosphorus while the controls retained phosphorus. Only one-eighth of the total phosphorus excreted by the rats on the phosphorus-deficient diet was in the urine, while three-fourths of the excreted calcium followed that route.⁸

Again using rats, Copp and Hamilton demonstrated that low-phosphorus rickets caused radioactive calcium to be lost rapidly from the bones while normal animals fixed the element in the skeleton. While there was rapid uptake by rachitic rats, there was no fixation. This rapid turnover suggests a small and labile calcium fraction in these animals. The plasma calcium clearance in rachitic animals is 10 to 15 times as great as in normal animals and approaches the glomerular filtration rate. So, as calcium is poured out in the urine, the serum calcium level continues to fall as well as the calcium in the labile bone fraction since they are in equilibrium. This is seen where there is a low level of serum phosphorus and appears to be the direct effect of the low phosphorus level on excretion by the kidney.²³

CONCLUSIONS

The above animal experiments point out that the immediate mechanism of the disease process we are considering is a low plasma level of phosphorus. The radioactive calcium experiments show how this can interfere with fixation of calcium in bone and subsequent ossification, thus producing rickets. Experimental low-phosphorus rickets closely simulates both the pathologic and metabolic changes seen clinically. This, plus the evidence presented to show

that parathyroid activity does not directly affect the renal tubule,^{6, 9, 12} points to an inherited defect of the renal tubule, namely, its inability to reabsorb phosphate from the glomerular filtrate as the basic metabolic defect in this disease. Dent concurs with this view and states further that the disease is often associated with other congenital tubular defects.⁸

TREATMENT

Treatment of hypophosphatemic renal tubular rickets is based on the threshold concept that a large, individualized dosage of vitamin D will be necessary to arrest the disease process. Vitamin D primarily increases calcium absorption from the gastrointestinal tract and decreases excretion of phosphate by the tubules;¹¹ but, as shown previously in this paper, this effect must be directly on the renal tubules and not because of secondary decreased parathyroid activity following increased serum calcium.^{6, 10, 13} It is known that massive doses of vitamin D will arrest the disease process, but this treatment is not entirely satisfactory. The recommended doses of vitamin D (100,000-500,000 units daily) are the same as those known to produce toxic effects. Vitamin D is thought to raise serum phosphorus level here when it produces slight toxic effects. The bones may be benefited, but one runs the risk of producing renal damage. Metastatic calcifications appear, and the kidneys are likely to calcify with a resultant renal insufficiency.

Since serum calcium and phosphorus both tend to rise, both calcium and phosphate increase in the urine following administration of vitamin D. For this reason urinary calcium excretion (Sulkowitch reaction) must serve as an index of overdosage. Vomiting is also a symptom of overdosage. Clinical improvement and x-ray evidence of healing of bone lesions can be used to set the minimum effective dose. As shown in one of the cases presented, healing will occur in spite of the low calcium-phosphorus product. Long term maintenance dosage can be determined by the same criteria.

Wallace has been studying cases treated with large dosages of vitamin D for some time. He has found evidence of marked renal insufficiency, but the mothers of these children do not necessarily have evidence of renal damage. He doubts that large doses of vitamin D will be advocated much longer.²⁶

This leaves one with the administration of extra phosphate salts by mouth in the hope of overcoming renal losses. The oral phosphate does give loose stools, and most people do not regard it as helpful since it does not alter the serum phosphorus level significantly. Darrow gave it with symptomatic relief in one case.⁷

PROGNOSIS

The disease is not curable in the same sense as infantile rickets. It can be arrested, as shown in the

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cases presented, but it must be treated continuously and it may recur. After epiphyseal closure and cessation of growth, most patients improve. The resulting condition has been referred to as chemical osteomalacia.² Finally, orthopedic procedures including osteotomy to correct deformities and intramedullary nailing to prevent further deformity may be necessary in the long-term management of certain cases.

SUMMARY

Hypophosphatemic rickets, showing the same changes as infantile rickets, is recognized as a clinical entity. The disease has been described and three illustrative cases are reported. Calcium and phosphorus metabolism is discussed.

Experimental and clinical evidence has shown that the basic defect in the production of the disease is the inability of the renal tubules to reabsorb phosphorus. This may be alone, or associated with other renal lesions, and is considered congenital.

Treatment consists of massive doses of vitamin D, although this has not proved to be entirely satisfactory. Oral phosphate administration and orthopedic procedures are advocated as useful.

The name hypophosphatemic renal tubular rickets is advanced as being more descriptive of the disease than the terms previously used.

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Commission on Professional and Hospital Activities

Organization of a Commission on Professional and Hospital Activities was announced in Chicago last month by the American College of Surgeons, American Hospital Association, American College of Physicians, and the Southwestern Michigan Hospital Council.

The commission will conduct a medical statistical service that will help hospitals simplify medical records and analyze records more effectively for improvement of medical and administrative practices. A grant of \$260,000 from the W. K. Kellogg Foundation, Battle Creek, Michigan, will support the program for three years, after which it is expected that the service may be continued on a self-sustaining basis.

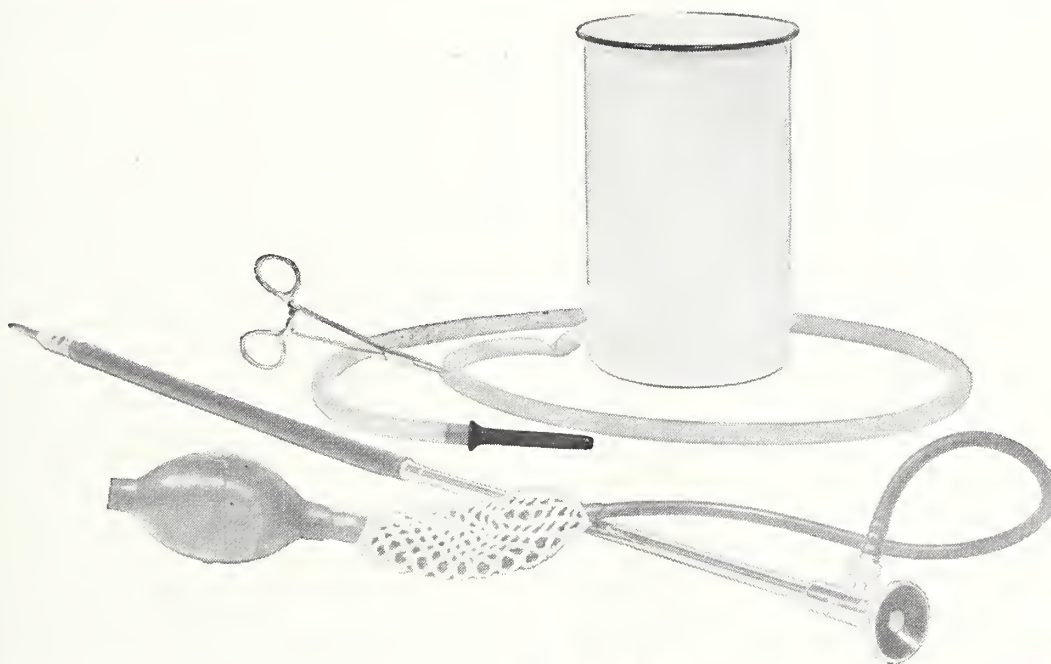
The commission is an outgrowth of a professional activity study carried on for the last three years by the Southwestern Michigan Hospital Council. The sponsorship of the three national organizations makes possible the broadening of the work and the extension of benefits to many other hospitals.

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BOOK REVIEWS

The Morphology of Human Blood Cells. By L. W. Diggs, M.D., Dorothy Sturm, and Ann Bell. Published by W. B. Saunders Company, Philadelphia. 181 pages, 31 color plates, 54 figures. Price \$12.

This book is not one that would be of special value to the general practitioner unless he were especially interested in hematology. There are several hundred good illustrations of various kinds of cells, blood, metastatic malignant cells, and tissue cells, showing their structure and characteristic features. The pictures dealing with sickle cells are unusually good. Little technique is given, but there are a few simple procedures on making slides, stains, etc. It is an excellent book for the worker in hematology, either technician or pathologist. There are also good pictures of lupus erythematosus cells and fixed tissue cells of bone marrow.—J. L. L.

Treatment of Heart Disease—A Clinical Physiologic Approach. By Harry Gross, M.D., and Abraham Jezer, M.D. Published by W. B. Saunders Company, Philadelphia. 549 pages, 91 figures. Price \$13.

Contents of this book are logically grouped in seven sections: The Basic Mechanisms of Cardiac Symptoms and Their Managements; Hypertensive and Arteriosclerotic Heart Disease; Diseases of the Heart Secondary to Inflammation; Congenital Heart Disease; Surgery in the Cardiac Patient; Disorders of the Heart Secondary to Metabolic Disorders, and Emotions, Adjustments and Rehabilitation in Heart Disease.

Only one of the extremely satisfactory features of this volume is the consistent construction of sound methods of treatment and management upon clear expositions of the disturbed physiology. Such a virtue is bound to appeal to both the critical student and the sophisticated clinician.

Coverage is broad, adequate, and properly apportioned according to the relative importance and frequency of the various cardiac problems.

Picking at random an example of thoroughness of discussion, we find the treatment of arteriosclerotic heart disease beginning with a discussion of the disturbed physiology, a brief discussion of clinical variations, medical treatment with all of the modern drugs and procedures, as well as a complete discussion of the surgical treatment.

Surgery in the cardiac patient is usually presented as an afterthought in textbooks of cardiology. Here it is properly and exhaustively treated.

Compactly bound, well printed, and quite readable, this is a book deserving many printings.—M. H. D.

Pulmonary Carcinoma—Pathogenesis, Diagnosis and Treatment. Edited by Edgar Mayer, M.D., and Herbert C. Maier, M.D. Published by J. B. Lippincott Company, Philadelphia. 540 pages. Price \$15.

This well-written and compiled book effectively covers the field of pulmonary carcinoma. The authors have pointed out that this would be an excellent book in the hands of the general practitioner. However, it is an excellent book in the hands of anyone interested in the prevalent disease of carcinoma of the lungs.

In the foreword to the main volume itself, by Charlotte S. Cameron, it is pointed out that extirpation of the present rate of rise indicates that lung cancer will soon be the concern of every family doctor. Mention is made of the role of the doctor in relationship to the patient with hopeless carcinoma.

The book effectively points out the effective and actual increase in the incidence of pulmonary carcinoma in the past few decades. An attempt was adequately made to encompass all the facets of pathogenesis, diagnosis, and therapy.

A discussion of possible etiologic factors is presented, together with various experimental approaches to lung cancer. The pathology of pulmonary neoplasms was presented from the standpoint of clinical correlation. The very last of the volume presents case reports illustrating common problems in diagnosis and management. An attempt is made to analyze the various diagnostic procedures, with reference to their value to the clinician and to the diagnostician. Chapters on radiation therapy, chemotherapy, and the use of isotopes, together with the medical management of inoperable cases, gives the clinician a complete survey of all aspects of this unfortunate disease.

Surgical therapy is discussed and analyzed. An assessment of indications for surgery and results therefrom is made.

All of the phases of diagnosis are covered, each in a separate chapter and by a separate and distinguished author. These include pathology, biology, and environmental aspects of lung cancer. The diagnosis of this disease is thoroughly covered in chapters on the clinical aspects of bronchography, exfoliative cytology, and radiology.

In addition to material on surgical therapy, radiation therapy, and the use of radioisotopes, there are additional chapters on chemotherapy and medical management.

At the end of the volume, preceding the case histories, is a provocative and well written thesis on "The Outlook for Cancer" by Cornelius P. Rhodes.

This is an excellent book of value to anyone interested in this unfortunate malady.—J. G. S.

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See Page 576

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By arrangement	EXFOLIATIVE CYTOLOGY

Garb, M.D. Published by Springer Publishing Company, Inc., New York. 160 pages. Price \$2.00.

This book is good in many ways. First, it describes the proper collection of specimens and stresses good specimens as prerequisites of dependable laboratory results. If the patient is to have a special diet, fasting, or bed rest preceding a test, then a note of instruction is given. Many helpful normal values are given, and under each test is a statement as to its significance, body function, or pathological importance. If a test is contraindicated, the author states the fact, as Bromsulphalein retention when jaundice is present.

Second, this material is well arranged. For tests performed on various body fluids, the name of each test is given and information on how each fluid is treated; for example, the test for methemoglobin is performed on whole blood, which means an anti-coagulant would be added. Tests are also grouped as to organ or function of that part.

The author has successfully written a book for student and graduate nurses. In a small laboratory, the book would be useful as a quick reference. For the student technologist, little technique is given; for the medical technologist, many explanations of principles are over-simplified.—*W. N. and L. H.*

Bellevue Is My Home. By Salvatore R. Cutolo, M.D. Published by Doubleday and Co., Inc., New York. 317 pages. Price \$4.00.

Bellevue Hospital, a medical city of roughly 9,700 population, would be impressive to some because of its size. Others might find it interesting because it operates on an annual budget of \$17,000,000. Still others might think of its personnel—1,000 visiting doctors, 459 interns and residents, 583 graduate nurses, 302 practical nurses, 500 student nurses, 1,322 attendants, 1,000 volunteers, 1,890 salaried personnel—and a daily average of 2,700 patients.

But to Dr. Cutolo, medical superintendent of the hospital, Bellevue is home. He has been there for 25 years. The warmth of the word "home" sets the tone for the book. Instead of seeing patients as statistics, he sees them as individuals; instead of seeing physical properties, he sees means for rendering help to those who need it. It is obvious that he finds satisfaction in his profession, stimulation in his work, and reward in service.—*P. F.*

Experimental Tuberculosis Bacillus and Host. Ciba Foundation Symposium. Published by Little, Brown and Company, Boston, for Ciba Pharmaceutical Products, Inc., Summit, New Jersey. 396 pages. Price \$9.00.

A symposium on "The Tubercle Bacillus and the Reactions of the Host Tissues" was held in England

in October, 1954, at the invitation of the Ciba Foundation, London. Leading research workers from different countries attended.

Tuberculosis is still a major disease and kills more persons than any other single cause of disease between 15 and 35 years. In most countries the number of new active cases continue at a high level, even with improved methods of treatment. The continued study of the fundamental nature of the bacillus, the basic pathogenesis, and of host reactions is necessary.

The symposium consisted of 24 scientific papers, including the opening and closing remarks, with discussions on tuberculosis, plus four papers on leprosy. These papers were given by internationally recognized scientists. Some of the subjects discussed were: the proteins, polysaccharides, and mycolic acids of the tubercle bacilli; early tissue reactions to the tubercle bacilli; biochemical factors which may influence the fate of the tubercle bacilli in tissues; bacterial components concerned in the early phase of infection; the serology of tubercle polysaccharides and various fractions of culture filtrates; chemical nature of the lipoidal factor of the tubercle bacilli responsible for the induction of tuberculosis hypersensitivity; tuberculosis hypersensitivity and desensitization; the mechanism involved in acquired immunity; the role of bacterial multiplication in establishment of immunity; and human lung tissue reactions to the tubercle bacilli in relation to chemotherapy.

The papers were good and discussions which followed most interesting. For all persons interested in tuberculosis, whether basic research or in clinical work, this book is recommended.—*C. A. H.*

Handbook of Toxicology, Volume I. Edited by William S. Spector. Published by W. B. Saunders Company, Philadelphia. 408 pages. Price \$7.00.

This 408-page paper-bound volume was prepared under the direction of the committee on the handbook of biologic data, division of biology and agriculture, the National Academy of Sciences, the National Research Council. It presents tabular data on the acute toxicity of many substances for several species of commonly used laboratory animals. These toxicities were determined by oral or parenteral administration or inhalation.

The principal contributor was Wolfgang F. von Oettingen, M.D., Ph.D., chief toxicologist of the National Institute of Health, Bethesda, Maryland. The guiding principle in the selection of material was that it be of basic importance and that the literary sources be reliable. Some valuable data was omitted, either because they were not on hand for publication or because there was insufficient time for preparation for printing. They did not exclude

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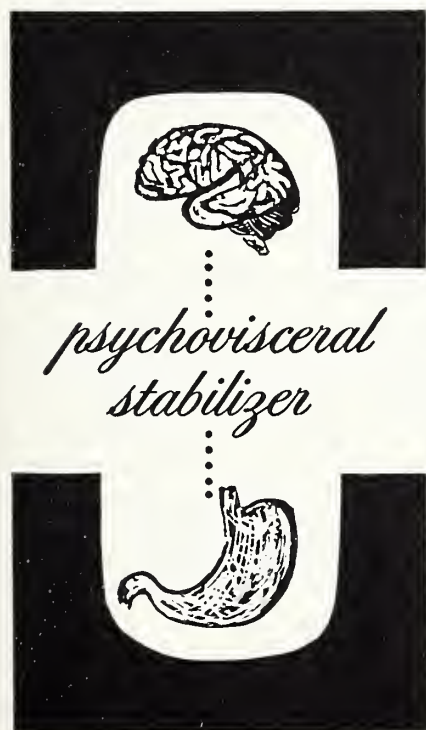
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data because it had been previously compiled or was available in other forms.

The objective of clarity of presentation was met successfully. They did this by selecting fundamental data for the body of their tables and by the concurrent use of abundant numbers of footnotes. Emphasis was placed on the fact that values given in their tables are by no means absolute, and subsequent interpretation should use listed values only as a yardstick of toxicity for the compounds listed. The authors recognize that the data, particularly in the field of acute toxicity, are subject to perpetual revision as investigators improve and standardize their techniques and gather more data.

The entire book is composed of two tables. The first table is entitled "Lethal Doses of Solid and Liquid Compounds; Laboratory Animals." The second table is entitled "Lethal Concentrations of Gases, Vapors and Fumes in Respired Air: Laboratory Animals." The first table is 319 pages; the second table is 42 pages. The index occupies the remainder of the book.

The subsequent volumes are scheduled to include the following:

Volume II—Physical, chemical, biological, and toxicological properties of antibiotic, antihelminthic, antiamebic, and antimalarial compound; a survey of chemical carcinogenic agents; metabolites of toxic compounds.

Volume III—Physical, chemical, biological, and toxicological properties of insecticides, fungicides, rodenticides, and herbicides; residues of pesticides on (or in) foods; minimum lethal concentrations of pesticides to domestic animals, farm animals, and wild life.

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Volume V—Toxicities of potential water pollutants; maximum allowable concentrations of toxic substances in air, drinking water, and food; agents and symptoms of chronic toxicities; skin toxicities; industrial toxicology; radiation toxicology.

Some 28 additional contributors were active in preparation of Volume I. From the above it is surmised that the five volume reference will constitute a most important encyclopedic reference for the toxicologist, the pathologist, the pharmacologist, and medical consultant. It is dubious that the encyclopedia will have much to offer the generalist.—N. V. T.

Physical Diagnosis. By Ralph H. Major, M.D., and Mahlon H. Delp, M.D. Published by W. B. Saunders

Company, Philadelphia. 358 pages, 536 figures. Price \$7.00.

This is an excellent revision of an already well written and established textbook in physical diagnosis. The original author is well known to most students of medicine and history of medicine and welcomes the co-authorship of Dr. Mahlon Delp who, for the past two decades, has been an outstanding teacher of physical diagnosis and professor of medicine at the University of Kansas School of Medicine.

The new edition contains many revisions; some paragraphs and chapters have been rearranged; excellent new illustrations have been added, and newer clinical entities are described.

The text adheres strictly to physical diagnosis and refers only to the other diagnostic aspects of disease when it clarifies the explanation.

This book should constitute a part of the medical library of every student of medicine and should be read and reread by all physicians interested in improving themselves in the practice of medicine.—C. C. G.

A Dictionary of Dietetics. By Rhoda Ellis. Published by Philosophical Library, Inc., New York City. 152 pages. Price \$6.00.

This book contains definitions of terms and references related to diet and diet therapy. The definitions are in a simple and understandable form. The book would be of value to a lay person in charge of the dietary department of a small hospital.—V. G. H.

Management of Menstrual Disorders. By C. Fred-eric Fluhmann, M.D. Published by W. B. Saunders Company, Philadelphia. 350 pages, 121 figures. Price \$8.50.

While the author has presented little new material, he gives a well organized review of the subject aimed primarily at the medical practitioner. The various menstrual disorders, diagnosis, and treatment are discussed separately, but their place in the general health of the individual has been kept. He emphasizes the danger of mistaking pathological uterine bleeding for abnormal menstrual bleeding.

The chapters on Gonadotropins, Steroid Hormones, and Control of Menstruation are basic and make a firm footing for the clinical discussions which follow.

The final chapter, devoted to clinical usage and commercial preparations of sex hormones, should have a practical value for every practitioner.—N. H. O.

Diseases of the Skin. By Richard L. Sutton, M.D.

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The publication of this book is a major event in medical literature. It is the 11th of a series begun in 1916; the third to bear the name of R. L. Sutton, Jr.; the first to bear only his name.

The book embodies several changes from previous editions. The most important is, perhaps, the organization. Dr. Sutton has organized the bulk of his book on the basis of etiology rather than morphology. But the usual chapters on basic sciences, such as anatomy, embryology, etc., are included. The size is bigger than ever, and to avoid publication in two volumes, the type size has been reduced.

The method of reference presentation is another change. The whole reference is sandwiched into the text. Line readers will find this jars them and slows them at first. Postscripted to each section there is additional bibliography with a word or sentence describing the article. This is an extremely valuable innovation and allows the reader to identify at once the particular facet of the literature he might wish to pursue.

Dr. Sutton has mentioned *everything* and discussed most things thoroughly. The discussion is never ponderous, and for the most part is immensely readable. Although the book is largely a catalogue of symptom pictures—and a most comprehensive one—it escapes being dull by the constant introduction of the author's opinion of all these ideas that have been stated by others. In the realm of therapy, the accepted modalities are all given and discussed, and the author is not reticent in stating his own views.

The book's major weakness and its strength are one and the same, vis., its immensity. This is no book to read in bed or to hold in one's lap—it weighs too much; but if one wants a thorough, well written discussion of anything dermatologic it will be herein contained.—C. M. L., Jr.

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Postgraduate courses in all specialties, University of Nebraska College of Medicine. Schedules and information available from Postgraduate Affairs, University of Nebraska College of Medicine, 42nd and Dewey Avenue, Omaha 5, Nebraska.

Second annual meeting, American Rhinologic Society, Chicago, October 9-13. No registration fee. Physicians invited. Write secretary, 834 Wellington Avenue, Chicago 14, Illinois.

Convention, American College of Gastroenterology, Roosevelt Hotel, New York City, October 15-17. Annual course in Postgraduate Gastroenterology, Roosevelt Hotel and Metropolitan Hospital Center, October 18-20. Advance registration required. Information available from College, 33 West 60th Street, New York 23, New York.

Seventh annual conference, National Association for Music Therapy, Hotel Jayhawk, Topeka, October 18-20. Registration fee \$5.00. Margaret Sears, Publicity Chairman, Topeka State Hospital, Topeka.

Meeting, Midwest Group of Medical Library Association, Henry Ford Hospital, Detroit, October 12-20.

School Health Conference, University of Kansas Medical Center, October 22 and 23. First day, discussions on heart disease; second day, pulmonary disease. Write Postgraduate Medicine, 39th and Rainbow, Kansas City 12, Kansas.

Postgraduate course in obstetrics, University of Kansas Medical Center, November 1-3. Registration fee \$35. Write Department of Postgraduate Medicine.

Meeting, American College of Obstetricians and Gynecologists, Palmer House, Chicago, November 7-9. Information and programs available, 116 South Michigan Avenue, Chicago 3, Illinois.

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*Modell, W.: The Relief of Symptoms, Philadelphia, W. B. Saunders Company, 1955, pp. 265-266.

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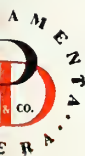
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TABLE OF CONTENTS

OCTOBER, 1956

Scientific Articles

Gamma Globulin Deficiency: Report of a Case and Survey of the Literature—Arnold H. Greenhouse, M.D., Garden City . . .	611
Pyloric Stenosis: Study of Surgical Treatment in 36 Cases—Donald R. Davis, M.D., Mission . . .	619
Trichobezoar: Report of a Case Involving the Stomach, Duodenum, and Jejunum in a Six-Year-Old Girl—Kenneth L. Graham, M.D., Leavenworth, and J. E. McConchie, M.D., Independence, Missouri . . .	624
Rehabilitation: Restoration of Function After Fractures Is an Important and Sometimes Neglected Feature of Their Treatment—	

Charles R. Rombold, M.D., and Cline D. Hensley, Jr., M.D., Wichita . . .	625
Tumor Conference—Report of a Case of Meningioma in Which Complete Cure Is Probable	636
Senior Thesis—Gastric Studies: Advantages and Limitations of Uropepsinogen Excretion Tests in Diagnosis . . .	644

Editorials

Care for Military Dependents . . .	631
The JOURNAL Grows . . .	631
Rural Health Conference in Kansas . . .	634

Miscellaneous

Just Browsing . . .	629
President's Page . . .	630

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Volume LVII

OCTOBER, 1956

No. 10

Gamma Globulin Deficiency

Report of a Case and Survey of the Literature

ARNOLD H. GREENHOUSE, M.D., Garden City

A new disease of unusual interest, manifested by a marked decrease or absolute deficiency of gamma globulin in the blood and a heightened susceptibility to infection, has been described with increasing frequency in recent years. This syndrome, variously named hypogammaglobulinemia, agammaglobulinemia, or globulin deficiency disease, is of utmost importance because of its basic and far-reaching implications to the field of immunology and to the pathologic physiology of the body's responses to infectious processes.

To the research worker a study of this entity affords an unusual opportunity to delve further into many of the unsolved problems of the body's immune mechanisms. To the clinician it is an excellent example of the pathophysiologic approach since its many laboratory and clinical features can easily be deduced from a knowledge of the basic defect. Judging from the many reports and discussions in the literature since the original case was recorded only four years ago by Bruton,¹ this certainly is not a rare condition, and its recognition is important since it doubtlessly explains many puzzling and obscure clinical pictures which are not otherwise well understood.

The patient described in the following report was observed recently at the University of Kansas Medical Center. His history is of interest since it is typical of the usual findings and serves to illustrate the major features of this condition.

CASE REPORT

A 58-year-old white male was first admitted to

the University of Kansas Medical Center in March of 1953 complaining of fever and cough and stating that he had had innumerable episodes of "pneumonia" for about 35 years. He said that his most recent difficulties had been in December of 1952, February of 1953, and just prior to this hospitalization. During each one of these episodes he had had fever, malaise, weakness, and a productive cough. He received inter-

Agammaglobulinemia is a recently described disease entity consisting of unusual susceptibility to frequently recurring infectious episodes associated with low or absent levels of gamma globulin in the blood. Typical clinical and laboratory findings are presented, and the treatment of one case is discussed.

mittent therapy with penicillin for several years, usually with good results. He claimed that he had shown no unusual susceptibility to infections prior to 35 years before, at which time he developed bilateral ear infections. Since then he had had repeated episodes, as described, but had felt well between febrile periods and had worked at various clerking jobs. No members of his family had shown similar tendencies.

The main physical findings at admission were a temperature of 104.4 degrees, an appearance of being both acutely and chronically ill, and moist

rales over the right lung posteriorly. The liver was palpable 4 cm. below the right costal margin and was soft and non-tender; the spleen was felt 2½ cm. below the left costal margin. There were no other important physical abnormalities.

Laboratory work revealed a 1-plus albuminuria but an otherwise normal urinalysis. Red blood count was 3,300,000, hemoglobin 10.3 grams, white blood count 2300 with 74 polys (8 non-filamented), 24 lymphocytes and 2 monocytes. Serology was negative; non-protein nitrogen was 33 mg. per cent; blood sugar was 90 mg. per cent. Skin tests were negative for tuberculosis, histoplasmosis, blastomycosis, and coccidioidomycosis. A congo red test showed 80 per cent of the dye remaining in the blood; phenol red excretion and urea clearance were normal. Agglutinations for typhoid, paratyphoid, brucella, and tular-emia were negative in all dilutions, as were cold agglutinins. Repeated blood cultures were negative, and nose and throat cultures showed the "usual flora."

Urine cultures showed a moderate growth of paracolon bacillus, and sputum cultures showed *E. coli* and hemolytic staphylococcus. Sedimentation rate was 32 mm. in one hour. Liver function tests showed a total serum bilirubin of 0.7 mg. per cent, alkaline phosphatase of 1.6 millimol units, prothrombin time 65 per cent of normal, bromosulphalein retention of "0," cephalin cholesterol flocculation 4-plus, thymol turbidity of 25 units, serum albumin of 4.2 gm. per cent, and serum iron of 54 gamma per cent. Bone marrow showed a neutrophilic hyperplasia of marrow tissue with a moderate increase in monocytes and monocytic-like cells. A liver biopsy revealed only mild acute and chronic hepatic changes. A lymph node biopsy was reported as showing lipomatosis. Bronchoscopy and bronchial washings revealed no malignant cells.

An electrocardiogram was normal, and a chest x-ray revealed an increase of the hilar shadow bilaterally, being more prominent on the right, and infiltrative changes in the base of the right upper lobe with some elevation of the right interlobar septum. Upper and lower gastrointestinal series were normal. A bronchogram revealed no major abnormalities, and an intravenous pyelogram revealed only minor changes consistent with minimal right pyelonephritis.

The patient's hospital course was one of continued fever controlled initially with aspirin. On the fifth hospital day he developed lower left chest pain, and at that time a chest film showed lower left lobe pneumonia. Penicillin and streptomycin were started, but the fever continued through the 23rd hospital day and there was no change in his general condition. At that time cortisone and Chloromycetin were begun, and his fever subsided shortly thereafter. These medications were gradually withdrawn and were discon-

tinued on the 32nd hospital day. Clinical improvement continued, and he was discharged on the 37th hospital day without any specific diagnosis having been made.

The patient's second University of Kansas Medical Center hospitalization occurred in March of 1955, almost exactly two years after his initial work-up. On this admission he stated that he had been in reasonably good health since his previous hospitalization except for an occasional short febrile bout. About two weeks prior to admission he started running a fever and was treated with Aureomycin, 250 mg. four times daily, and within a few days became afebrile until the day prior to his hospitalization. Physical examination revealed a well developed, well nourished white male who appeared chronically ill. His temperature was 102 degrees, and he had a marked seborrheic dermatitis involving his scalp and face. The liver was palpable 3 cm. below the right costal margin, and the spleen was felt 2½ cm. below the left costal margin. The lung fields were clear, and the heart was normal to examination. There were no palpable lymph nodes and physical examination was otherwise unremarkable.

His red blood count was 3,500,000, white blood count was 7300 with a differential count of 69 polys (17 non-filamented), 21 lymphocytes, and 10 monocytes. Blood chemistries were within normal limits, serology was negative, and the glucose tolerance curve was normal. Agglutinins for typhoid, paratyphoid and brucella were negative in all dilutions.

Urine cultures were negative, and repeated sputum cultures failed to grow out any significant organisms. Heterophile and cold agglutinins were absent, and blood cultures were negative on several occasions. Sedimentation rate was 14 mm. in one hour. An electrocardiogram was within normal limits. Bone marrow biopsy was reported as showing an increase in monocytes and monocytic-like elements and a shift to the left in neutrophilic elements. Liver function profile revealed a serum bilirubin of 1 mg. per cent, total cholesterol of 240 mg. per cent with 54 per cent esters, serum albumin of 4.9 gm. per cent, serum globulin of 0.46 gm. per cent and bromosulphalein retention of 21 per cent. Thymol turbidity and cephalin cholesterol flocculation were negative.

Electrophoretic studies of his blood failed to show the presence of gamma globulin. A careful study of his blood hematologically failed to show isohem-agglutinins. Typhoid immunization was attempted, and he responded to each injection with marked temperature spike, but repeated studies in ensuing weeks failed to reveal any agglutinins to typhoid. The patient was febrile during the early part of his hospital stay until he was given an injection of 20 cc. of gamma globulin, at which time his temperature

subsided almost dramatically. He remained afebrile except for the temperature elevations with typhoid immunization and felt well on discharge from the hospital. Since then, he has been followed in the Kansas University Medical Center Out-Patient Clinic and has had a few febrile bouts, each of which responded promptly to gamma globulin injections.

HISTORY AND CASE REPORTS

The first recorded case in which a typical clinical syndrome was correlated with a decrease of gamma globulin in the blood was reported by Bruton¹ in 1952 in an eight-year-old boy who had had repeated blood stream and respiratory infections for four years. On ten separate occasions a pneumococcus had been recovered from his blood. This child had mumps at three separate times and failed to develop a negative Schick test after repeated injections of diphtheria toxoid. He was also found to be unable to produce antibodies against typhoid vaccine and pneumococcal polysaccharide. Electrophoretic studies showed a complete absence of gamma globulin in his blood, and intermittent injections of gamma globulin resulted in both symptomatic and clinical improvement.

Numerous other reports have followed in the last four years with a steady stream of descriptions of this disease. It is now apparent that this is probably not a rare condition but one awaiting only greater awareness by the clinician to make its recognition relatively common. Of the more recent reports, Jane-way has described nine boys with agammaglobulinemia and suggested that this was sex linked and a congenital defect.²

An early report of this entity involving a female was that of an eight-weeks-old girl who did not develop neutralizing antibodies to vaccinia and who died of progressive vaccinia. Her blood showed no gamma globulin, and autopsy showed a striking absence of lymphocytes in lymph nodes and spleen, correlating with clinical lymphopenia.

This entity has been described in a 58-year-old female with malignant lymphoma, indicating its presence in other disease states. Various authors have stressed the frequency of bronchiectasis in adult cases. Splenomegaly has been frequently cited in these patients, with an accompanying leukopenia. Various other interesting case histories have also been recorded, and all have stressed the virtual lack of resistance to infection with an accompanying grossly deficient blood level of gamma globulin. Most of these reports deal with the fascinating clinical ramifications of this problem and include speculation as to the yet unknown origin of the underlying disease problem.

PHYSIOLOGY OF THE IMMUNE MECHANISM AS RELATED TO GAMMA GLOBULIN

One of the reasons for the tremendous amount of interest in this disease is that it certainly gives proof to the long suspected belief that gamma globulin is closely related to the mechanisms of resistance to infection. However, unfortunately, there are many gaps in our knowledge about gamma globulin itself.

It has been calculated that approximately 13 per cent of the total serum proteins are gamma globulin, which is chiefly concerned in the immunological process, but a small portion of the gamma globulin fraction is, however, of unknown significance. Careful studies have demonstrated that there are various subfractions of the gamma globulin with each portion having antigenic activity, that their precipitability with different antigens varies, and that there presumably are inhibiting fractions which can block precipitation of one sub-group while enhancing precipitability of another. Antibody titers are said to be the result of competing protein molecules of varying reaction capacity. However, not all antibodies are in the gamma globulin group, for blood group isohemagglutinins, typhoid "O" agglutinins, and true Wassermann reagin are said to be beta-2 globulins.

The normal adult has 25 mg. of circulating gamma globulin in dynamic equilibrium with a similar amount which is located extravascularly, and the serum levels are closely related to adaptive processes. They are known to be high at birth because of the transplacental transmission of antibodies, fall for several months, and thereafter rise slowly as the individual comes in contact with immunizing diseases. This low gamma globulin in infancy seems well correlated with the fact that the early months are the precarious ones as far as infectious diseases are concerned, and many clinicians feel that treatment with pooled gamma globulin protects against infectious episodes in young children as well as in others with refractory infections. Studies with the administration of radioactive gamma globulin (tagged with I^{131}) have shown that half life is approximately 13 days in adults and 20 days in children and that the normal adult apparently catabolizes one-third of his total supply (about 3.8 grams) daily.

Perhaps the greatest defect in our knowledge of the globulins is related to their site of origin. It would seem that the existence of this disease with its immunoglobulin defect would point to a special site and mechanism for its synthesis. Various workers favor the reticulo-endothelial cells, immature tissue lymphocytes, plasma cells, or a combination of these. There is favorable evidence for the plasma cell as a site of gamma globulin production since it has been shown that in hyperimmune rabbits there is a massive

plasma cell infiltration of many organs, and the high gamma globulin levels which accompany this state fall with cortisone-induced regression of these cells. In children with agammaglobulinemia, regional lymph nodes show no germinal center formation or plasma cells after antigenic stimulation, whereas this is not so in normal children. In multiple myeloma, a disease involving plasma cells, aberrations of gamma globulin have been reported. Careful bone marrow studies in patients with agammaglobulinemia seem to point toward a plasma cell deficiency as compared to normal persons, and the same is true in reported investigations of lymph node histology. In persons with rheumatic fever, in which elevated gamma globulin levels frequently are encountered, plasmacytosis is often seen.

However, there is also some fairly impressive evidence implicating fixed tissue lymphocytes which, it is suggested, may become released as blood lymphocytes or while still in lymphoid tissue may undergo cytolysis and give rise to blood antibodies by shedding their surface protein films. To support this view, several authors cite lymphopenia in patients with agammaglobulinemia. They also point out that histologically lymph nodes tend to be hypoplastic, which raises a strong temptation to correlate the absent gamma globulin, blood lymphopenia, and quantitative lack of tissue lymphocytes at biopsy and to interpret them as being due to greatly reduced lymphopoietic activity. In refutation of this idea, however, is the knowledge that not all persons with this disorder show definite evidence of reduced lymphocytic activity.

Of some importance is the fact that factors other than gamma globulin are related to the body's ability to resist infectious episodes, and these must be considered in the evaluation of individuals who seemingly have an inability to cope with infection. It has been pointed out that local anatomical changes, including diminished blood supply and obstruction to hollow viscera, changes in tissue reactivity as might occur in various metabolic disorders (scurvy), and failure of normal defense mechanisms as might occur under heavy anesthesia or with neutropenia, all vitally influence the host's response to a bacterial or viral invasion. Of great interest along the same lines is a newly discovered serum protein, properdin, which seems to act with complement and magnesium and seems to participate in such reactions as destruction of bacteria, neutralization of viruses, and lysis of certain red blood cells.

ETIOLOGY OF GAMMA GLOBULIN DEFICIENCY

There has been no really adequate explanation of the etiology of this disorder, a fact which probably is to some extent related to our deficiency in knowledge

of the basic physiology of gamma globulin. It is important to appreciate that low levels of gamma globulin have been recognized in various disease states, such as severe nutritional deficiency, the nephrotic syndrome, multiple myeloma, in states associated with marked protein catabolism, in so-called idiopathic hypoproteinemia, and in the face of inadequate lymphoid tissue function, such as might occur with cancerous replacement and radiation damage to lymphatic tissues. These conditions differ from the disease described in this paper since they are associated with low total proteins of which gamma globulin deficiency is only a part.

From a clinical point of view it would seem likely that there are numerous causes of gamma globulin, many of which are not at all understood as yet. Most authors are inclined to divide their cases into acquired and hereditary. The latter type was brought to mind almost immediately since early case descriptions were all noted in male children. Many authors soon believed that agammaglobulinemia was a sex-linked recessive condition, analogous in its mode of transmission to hemophilia, with the basic defect being an inability to synthesize gamma globulin. However, it was not long before an increasing number of case reports began to appear describing this disease in adults of both sexes who had clearly had their afflictions for only a few years. At this point it became feasible to describe a secondary or acquired form of this entity which seemed to develop at any age and in either sex.

It is felt that in some of the acquired cases the globulin deficiency is secondary to a definite disease process which involves the lymphatic or reticulo-endothelial system, such as leukemia, sarcoidosis, Hodgkin's disease, histoplasmosis, et cetera. Most of the so-called "acquired" cases which have been described, including the one outlined in this paper, are not associated with any discernible underlying disease state. This makes appreciation of their etiology a rather difficult matter.

An interesting hypothesis has been presented by Bram and Morton²⁹ who find it difficult to envision any acquired process that would selectively assault globulin production without affecting closely related functions. They feel that elimination of a single protein is much more characteristic of a hereditary process in which the gene for that particular function is defective. They also point out that the late appearance of this process in some patients is not inconsistent with their theory, particularly when it is considered that many inherited defects make their appearance at varying ages.

It too is their belief that some of these "secondary" cases described in lymphomas probably were not associated with a lymphoma in so far as pathologists

at times have great difficulty in distinguishing a primary neoplastic change from the intense reticulo-endothelial hyperplasia that can occur in response to agammaglobulinemia.

Furthermore, they believe that cases described as being due to a granuloma or other infectious processes showed that more than likely the infection that was present was related to the patient's poor resistance due to globulin deficiency because it seemed unlikely that a granulomatous process could involve globulin producing centers alone. Their reasoning sounds logical, and it would seem that the hypothesis they present has much merit. However, in most studies little clinical evidence can be obtained showing a familial incidence, and examinations of relatives of patients with gamma globulin deficiency have revealed no globulin defects.

It has been suggested that perhaps gamma globulin deficiency could be related to some defect in the pituitary-adrenal axis. Good and Kelly³⁷ studied seven patients with this disorder to see if they could ascertain any adrenal-cortical dysfunction, but with careful laboratory examination they could find nothing to support such a concept. Martin³⁴ raised another interesting point relative to the etiology of this disorder by studying the blood proteins of four premature infants, and he discovered an almost total lack of gamma globulin at or before the 26th week. It is his belief that agammaglobulinemia represents in some manner a persistence of the fetal pattern.

NATURE OF THE GLOBULIN DEFECT

In the absence of any definite knowledge as to where in the human body gamma globulin is produced and what mechanism is responsible for its deficiency, it might seem presumptuous to inquire into the physiologic nature of the globulin defect that exists. Several theoretical factors causing low globulin levels can be postulated, including, (1) a diminished rate of globulin formation, (2) a diminished rate of delivery of the formed globulin to the peripheral blood, (3) an increased rate of utilization in the body, (4) an increased rate of destruction or loss from the circulation, or (5) a definite combination of these factors.

Fortunately, in recent years it has been possible to perform tracer studies with I^{131} labeled gamma globulin which has enabled us to learn something along these lines. It has been demonstrated that the rate of disappearance of tagged globulin is no different in individuals with agammaglobulinemia than in normal persons. This would seemingly indicate that the basic defect is an inadequate synthesis of gamma globulin. This would, of course, bring to mind the possibility that this condition could be the result of

an insufficient supply of precursor material for gamma globulin synthesis. Unfortunately, knowledge of gamma globulin precursors is incomplete, but certainly synthesis does not seem dependent upon protein intake.

In patients with certain rare types of liver disease, gamma globulin deficiency can occur even though there are high levels of protein intake. This suggests that the liver probably produces some unknown material needed for gamma globulin production. Deficiency of pyridoxine or pantothenic acid or administration of the pyridoxine antagonist, desoxy-pyridoxine, can result in gamma globulin deficiency in animals, but the required degree of lack of these vitamins must be severe. Administration of these substances in human patients seems entirely without effect.

CLINICAL FEATURES

Most of the important clinical features of patients with gamma globulin deficiency have already been mentioned. The salient picture which should, of course, bring about instant suspicion of this diagnosis is the presence of constantly recurring infectious episodes. The literature is full of fascinating illustrations of the various interesting clinical pictures that can result from this deficiency state. It has been mentioned that (1) many of these individuals present neutropenia and splenomegaly, (2) bronchiectasis is an extremely common finding, (3) repeated attacks of diseases which usually confer permanent immunity are frequently seen, and (4) on occasion some of these patients have had more than one episode of meningitis or septicemia.

Of more than passing interest are the cases reported by Varco and his associates^{21, 22} in which skin was successfully grafted on a person with agammaglobulinemia from an entirely unrelated donor, whereas the reverse could not be accomplished. They felt that this successful homotransplant provided strong support for the concept that an immunologic mechanism was responsible for the usual failure of homotransplants in man except in monozygotic twins.

Another noteworthy case was recorded by Latimer¹⁷ in an individual who had never shown any unusual susceptibility towards infection until after she was subjected to a breast biopsy, following which she developed a huge necrotic wound of her entire chest wall which would not heal until gamma globulin was administered, after it was discovered that she did have a globulin deficiency.

In summarizing the important clinical features that should be present to make the clinician suspect the possibility of agammaglobulinemia, the following are listed:

1. Grossly inadequate resistance to infection, as

manifested by frequently recurring and unusually severe infections.

2. Failure to develop clinical immunity after a seemingly adequate antigenic stimulus, such as a definite history of repeated attacks of a disease usually conferring permanent immunity.

3. Certain laboratory findings which confirm the diagnosis and which will be elaborated on in the section to follow.

Seltzer and his associates,²⁶ in discussing this problem, raise a puzzling point as to how it is possible for these patients, with no protection against infectious illnesses, to survive any time at all. Surprisingly enough, in many of these persons, including the one described in this paper, survival with this disease process extends for 35 years or more. They suggest several explanations: (1) the fact that most viral infections are self-limiting, (2) that antibodies to infectious agents are not solely in the globulin fraction, (3) that there probably is a tissue immunity not depending on circulating antibody, and (4) that extremely low levels of circulating antibody, not detectable by current laboratory methods when present, may still be sufficient to eradicate certain infectious processes. To this may be added the properdin system already discussed, as well as a report by Henschel,¹⁹ who discovered that in one of his patients periods of agammaglobulinemia alternated with periods of hypogammaglobulinemia, during which time detectable globulin levels were present. This latter mechanism may not be an uncommon one and could be important in pointing out why these individuals may have periods of relative freedom from infection.

LABORATORY PROCEDURES FOR DIAGNOSIS

A discussion of laboratory procedures useful in establishing a diagnosis of gamma globulin deficiency seems almost superfluous, since only chemical proof is necessary to show that gamma globulin levels are depressed. However, the situation is complicated by the fact that the determination of gamma globulin levels is a complex procedure still reserved for specialized laboratories. Therefore, we are forced to use other methods which are easier and which would indirectly be useful in establishing or confirming the diagnosis. The following have been useful along these lines.

1. *Methods of determining gamma globulin.* The major methods of use are chemical, filter paper electrophoresis and Tiselius electrophoresis. The two former methods involve in their final steps a calorimetric reading that, at low levels of gamma globulin, is subject to considerable error. The filter paper method is subject to the greatest error of all because of the diffuse endpoint and calorimetric error. However, filter paper electrophoresis does serve its purpose

well in following changes, particularly when these are performed by the same person. In recent years it has become increasingly possible through delicate immunochemical methods to demonstrate small amounts of gamma globulin in the blood; many of these patients, formerly believed to be completely lacking in gamma globulin, are now seen to have levels of 20 mg. per cent up to 300 mg. per cent. Normal gamma globulin levels are in the range of 600-1200 mg. per cent.

2. *Zinc turbidity.* This is a simple screening test which is usually elevated in most persons with repeated infections, yet in agammaglobulinemia no turbidity results.

3. *Total proteins and A/G ratio.* If agammaglobulinemia is suspected, an investigation of total and fractional proteins will be helpful. In the patient described in this report, the diagnosis was almost confirmed before electrophoretic studies were performed by the fact that the total globulin levels, as performed by the usual techniques, were 0.46 gm. per cent. It has been pointed out that in the Howe technique, which is most frequently used in determining fractional proteins, the alpha-globulins, whose levels are normal in this disease, are actually measured with the albumin fraction, whereas the beta-globulins, which are usually reduced in agammaglobulinemia, are determined along with other globulins, making for a high A/G ratio.

4. *Plasma hemagglutinins.* The hemagglutinins against heterologous blood group cells, which actually fall in the beta-2 globulin fraction, are low or absent in this disorder, which actually points up the fact that the deficiency is more than one of gamma globulin. Thus, individuals with type A blood do not have any appreciable titers of anti-B isoagglutinins, and those with type O blood do not have anti A and B isoagglutinins. This, theoretically, would make all of the persons with this disorder universal recipients.

5. *Defective response to antibody challenge.* One of the most useful tools in studying this disease is related to the fact that its victims are incapable of responding with antibody production to an antigenic challenge either from a naturally occurring disease or purified antigen. It has been shown that after administration of typhoid vaccine no levels of typhoid agglutinins can be obtained, after diphtheria immunization the Schick test remains positive, and no antibodies are developed in response to the injection of pneumococcal polysaccharide. Along the same lines these patients usually do not develop positive tuberculosis or histoplasmosis skin tests and have completely negative titers to practically all antigenic stimulants that can be measured.

6. *Other laboratory procedures.*

a. Unexpected normal results: Sometimes in these

patients one sees normal results in tests depending upon gamma globulin abnormalities. Thus, the thymol turbidity and cephalin cholesterol flocculation are normal in individuals with apparent liver disease in whom an elevation might be expected, as in the case of the patient in this discussion who had a negative cephalin cholesterol flocculation and thymol turbidity in the face of seemingly obvious hepatic dysfunction.

b. Sedimentation rate: The sedimentation rate is not influenced by gamma globulin changes since fibrinogen, the plasma protein which determines the sedimentation rate, is normal in this disease. The same is true of the C-reactive protein and other acute phase reactions which are not influenced by globulin changes.

c. Lymphocyte counts and lymph node histology: In many patients with gamma globulin deficiency lymph nodes have been observed to be rather strikingly hypoplastic, and some authors have used this as support for their belief that lymphatic tissue produces gamma globulin. Some patients with this disorder presumably have been found with lymphopenia, but this is not a consistent finding and was not so in our case.

TREATMENT OF GAMMA GLOBULIN DEFICIENCY

Naturally treatment of gamma globulin deficit consists of administration of gamma globulin. Most authors agree that if a blood level of 100-150 mg. per cent of gamma globulin is achieved, it will be sufficient to prevent further difficulty. In order to achieve such levels, 20 cc. of gamma globulin is sufficient when injected every 4 weeks in adults. In children, who have a longer half life of gamma globulin, medication in smaller amounts can be given about every 6 weeks. It is fortunate that one need not give gamma globulin in dosage sufficient to achieve normal blood levels since the normal adult would require 25 cc. of the commercial 15 per cent solution for complete replacement therapy.

The material cannot be given intravenously because of severe hypotensive reactions, whereas intramuscular doses of over 20 cc. are said to result in chills, fever, myalgia, and faintness. In the literature, dosage schedules of 0.3 cc. per pound are recommended, but this would lead to tremendous injections (30 cc. in a 100-pound individual). One report from Rome¹⁸ points out that if gamma globulin is not available, whole blood transfusion can be given in certain patients and these will control symptoms although an added element of risk is introduced. No other therapy has been of any avail, including pyridoxine, a deficiency of which is said to lead to gamma globulin deficiency in animals, and ACTH. The use of antibiotics, both therapeutically and prophylactically, is indicated.

INCIDENCE

This disease is by no means an uncommon one, as evidenced by the steady stream of case reports published in only a few short years since the original description. Undoubtedly, each reader can bring to mind several patients he has seen in the course of his practice who were potential candidates for this diagnosis. Very few studies of actual incidence are available, but helpful along these lines is a study by Verschure²³ who did electrophoretic studies of the serums of 2300 persons and discovered 15 people (11 men and 4 women) with defective gamma globulin levels, an incidence of 0.65 per cent. The practical importance of remembering the frequency of this disorder was pointed out by Kozinn,²⁰ who mentioned a case of generalized vaccinia developing in an infant with globulin deficiency who had received a smallpox vaccination in New York City during the course of a mass inoculation program.

SUMMARY

A case is described of a 58-year-old white man who has a clinical picture and laboratory findings consistent with the important recently described entity which has been termed agammaglobulinemia. This process consists of an unusual susceptibility to frequently recurring infectious episodes associated with low or absent levels of gamma globulin in the blood. It is felt that this entity is of interest and significance since it definitely has many implications in the field of immunology. It is pointed out that the site of origin of gamma globulin in the body is not yet known, that there is reason to think that this disease can be legitimately divided into hereditary and acquired forms, and that the basic defect seems to be an inability of the body to synthesize new gamma globulin, although the reason for this inability is unknown. The typical clinical and laboratory findings are stressed, replacement therapy with gamma globulin is mentioned, and the not uncommon incidence of this disease is pointed out.

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Scientific progress is like mounting a ladder; each step upward is followed by a brief pause while the body regains its balance, and we can no more disregard the steps which have gone before than we could cut away the lower part of the ladder.

—O. G. Sutton

Pyloric Stenosis

Study of Surgical Treatment in 36 Cases

DONALD R. DAVIS, M.D., *Mission*

Pyloromyotomy for congenital hypertrophic pyloric stenosis marks one of the greatest advances in abdominal surgery during the past half century.

Hirschsprung⁴ is credited with the first accurate description of the disease in 1887, and immediately afterward surgeons began a search for a satisfactory method of dealing with the problem. Divulsion of the pylorus with graduated sounds introduced through a gastrostomy opening, complementary jejunostomy, pyloric resection, gastroenterostomy, and pyloroplasty of a Heinike-Mikulicz type were tried, but the high mortality rate attendant with these operations (50-75 per cent) made their use prohibitive.

In 1907 Fredet³ introduced a technique of pyloromyotomy which included longitudinal division of hypertrophic muscle down to the mucosa, but not through it. The muscle was then sutured in a transverse direction, leaving the mucosa intact. His results were much better than those obtained with other methods used at that time.

Four years later Rammstedt,^{10, 11} while attempting Fredet's operation on an emaciated infant, was unable to complete the transverse closure of the pyloric incision because of sudden collapse of the patient. He terminated the operation abruptly by returning the pylorus to the abdomen with the wound gaping and the mucosa pouting out through it, then hastily closed the abdominal wound. The patient was returned to his room in a moribund state with little hope for survival. To Rammstedt's great surprise, the patient made an uneventful and complete recovery. Entertaining the idea that simple division of the hypertrophic muscle was all that was necessary to effect a cure, Rammstedt had the courage of his convictions. He repeated the "incomplete Fredet operation" on subsequent patients and observed equally gratifying results. Thus, the Fredet operation, which embodied the basic principles of treatment, was accidentally streamlined into the classical Fredet-Rammstedt pyloromyotomy universally accepted today.

In the past it has been the belief that all patients should be given a trial of medical therapy provided, of course, the infant had not already reached a serious state. In such instance, operation was carried out as soon as the state of hydration, alkalosis, and anemia

had been corrected. In recent years, particularly in American clinics, there has been a shift from this point of view in favor of early surgical treatment.

Jacoby,⁵ Todd,¹³ Malmberg,⁸ and others have reported satisfactory results with medical treatment for this disease. In the main, medical management consists of the administration of antispasmodics (atropine, eumedrin, scopyle) before each feeding to relax the pyloric sphincter, the use of thick cereal preparations with re-feeding after vomiting, and frequent gastric lavage to remove mucus. For reasons that are obvious, an intelligent and patient mother is a necessary prerequisite for the success of such a program. Virtually all who support medical treatment look upon it as a "trial of therapy," so-to-speak, and they readily yield their patients to the surgeon when and if failure becomes evident.

Surgical treatment of congenital hypertrophic pyloric stenosis should be carried out as soon as the patient can tolerate the procedure. This report concerns patients treated by 11 surgeons in Kansas City over a 10-year period.

In view of the fact that the death rate is low in surgically treated cases, that cure is rapid and complete, and that the baby readily gains weight and strength and can soon be returned to its home, I am of the opinion these babies should be operated upon as soon as their condition permits. Early operation amounts to considerable economic saving since, after operation, hospitalization is reduced to a few days in contrast to the long and tedious programs of medical therapy which often terminate with the necessity for surgical treatment anyway.

MATERIAL

Case histories of infants operated upon for congenital hypertrophic pyloric stenosis at Bethany, Providence, and St. Margaret's Hospitals, Kansas City, during the 10-year period beginning January 1, 1946, and ending December 31, 1955, have been studied. There were 36 cases representing the work of 11 sur-

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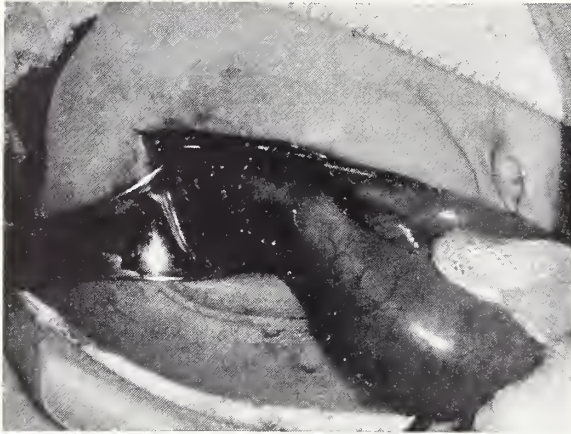


Figure 1. Photograph showing typical spool-like tumorous deformity of pylorus in congenital hypertrophic pyloric stenosis. Note "avascular area" on the anterior superior aspect of pylorus.

geons. All patients were found to have a typical spool-like tumorous deformity of the pylorus (Figure 1) at operation, and all were treated with Fredet-Rammstedt pyloromyotomy (Figure 2).

Special reference was made to the patient's age, sex, clinical symptoms and signs, duration of symptoms, type of infant feeding, pre- and postoperative weight, technique of operation, complications, mortality rate, and results of surgical treatment.

RESULTS

There were 28 males and 8 females, a ratio of 3.5:1. The average age at onset of symptoms was 23.7 days, and home treatment was carried out an average of 12.7 days preliminary to admission to the hospital. The youngest patient was 14 days old, the oldest 5 months. Seven infants were breast-fed, 29 were formula-fed.

Projectile vomiting was present in 100 per cent of cases. The majority of infants had been "feeding problems" to some degree since birth, but in all cases it was possible to date the onset of their disease specifically. Dehydration was present to some degree in all cases; however, in none could it be classed as severe. Peristaltic rushes were visualized in more than half of the infants (55.5 per cent), and in 41.6 per cent an olive-sized tumor could be palpated in the right upper quadrant of the abdomen. X-ray examination with barium swallow was done in 17 cases and showed evidence of partial or complete pyloric obstruction in every instance. There were no errors in diagnosis.

Only one patient was submitted to surgery without a trial of medical therapy incorporating antispasmodics and adjustment of dietary regime. Thick cereal-containing formula preparations were used in most in-

stances, and systemic reactions to atropine were frequent. Careful attention was paid to fluid and electrolyte balance, and patients were prepared preoperatively an average of 6.4 hospital days. Anemia was infrequently encountered, and preoperative transfusions were required in only two instances.

Inhalation anesthesia with ether, ethyl chloride, nitrous oxide, and Vinethene, alone or in combinations, was used in 66.6 per cent of cases. Inhalation anesthesia supplemented with local infiltration of the abdominal wall was used in 19.4 per cent, and in 13.9 per cent of cases local infiltration alone was used. Twenty-eight cases were approached through a right rectus muscle-splitting incision placed high over the right lobe of the liver. Five had transverse incisions, and three had subcostal incisions.

The duodenum was opened inadvertently during the course of pyloromyotomy in six cases, an incidence of 16.6 per cent. In five cases, simple closure was accomplished by sewing the mucosal rent with fine intestinal catgut. Four cases were closed longitudinally, and one case was closed in a transverse direction. In the remaining case in which the duodenum was opened, the mucosa, muscle and peritoneum were closed in layers with No. 00000 intestinal chromic catgut and silk, then the tumor was rotated 90 degrees and another pyloromyotomy was done.

One patient in whom the duodenum was opened subsequently died, but death was in no way related to this operative accident. One patient in whom simple closure was done developed a wound infection with deep dehiscence on the sixth postoperative day. The patient was returned to the operating room and the wound was secondarily repaired. The remaining four cases showed no deleterious effect whatever from accidental duodenal perforation. An omental graft was used to reinforce the site of pyloromyotomy in

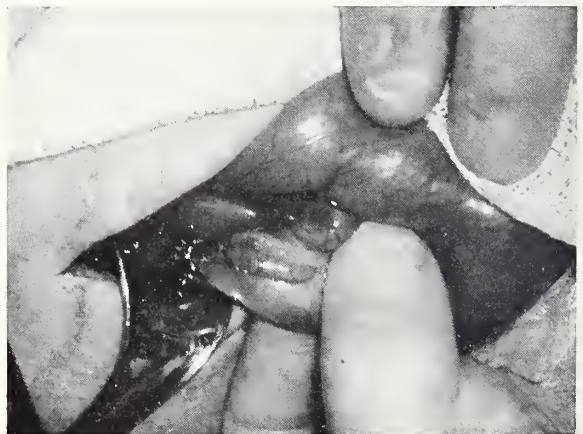


Figure 2. Photograph of completed Fredet-Rammstedt pyloromyotomy. Note mucosa pouting out through divided muscle fibers.

three patients in whom the duodenum had not been opened, and in five patients Gelfoam was used to control ooze at the site of pyloric incision.

Eighty-three per cent of patients vomited during the immediate postoperative period, but, in most instances, vomiting was minimal and of little concern. The stomachs of all babies not suffering from postoperative vomiting were aspirated at the termination of the operation.

Upper respiratory infections developed in two patients postoperatively. In one patient it culminated in post-infectious purpura hemorrhagica and death; in the other it resolved promptly and the baby recovered. Wound dehiscence occurred in five infants during the postoperative period; in two this was superficial and did not require secondary closure. One patient with deep dehiscence and two with frank eviscerations were returned to the operating room for wound repair. All patients with wound disruption completely recovered.

There were two deaths in this series, giving a mortality rate of 5.5 per cent. One patient succumbed to generalized peritonitis and multiple pulmonary abscesses. Necropsy findings indicated peritonitis was caused by laceration of the jejunum with perforation, presumably of accidental origin at the time of operation. Aspiration pneumonitis with pulmonary abscess formation also contributed to this baby's demise.

The second death was a five-month-old infant who was found at operation to have a typical spool-like tumorous deformity of the pylorus. The duodenal mucosa was opened accidentally during pyloromyotomy and closed transversely with fine chromic catgut, utilizing an omental graft to reinforce the pyloric rent. The patient developed an upper respiratory ailment during the immediate postoperative period and his condition worsened rapidly to a point where several transfusions of whole blood were required. Death ensued on the seventh postoperative day from postinfectious purpura hemorrhagica. Necropsy revealed extensive hemorrhages into the skin and subcutaneous tissues, heart, lungs, kidneys, liver, and other abdominal viscerae.

In the 34 surviving patients cure was complete. In most babies feeding formulae were tolerated within a day or two after surgery. They all gained promptly in weight and strength, and all surviving babies were in excellent condition when dismissed from the hospital.

Antibiotics were used in 83.2 per cent of cases; 29 babies received penicillin, one baby received sulfadiazine, and six babies received no antibiotic at all during the postoperative period. The average weight of babies on admission to the hospital was 7.6 pounds; on dismissal, 8.2 pounds. Patients were hospitalized an average of 17.1 days; the shortest hospi-

tal stay was four days, the longest 56 days. After pyloromyotomy, patients were dismissed after a postoperative period averaging 10.4 days.

FREDET-RAMMSTEDT PYLOROMYOTOMY

The infant usually arrives at the operating room in the arms of a pediatric nurse, its extremities having been wrapped generously in sheet-wadding and swathed liberally in blankets to conserve body heat. The baby is placed on the operating table in a supine position and secured by fixing the sheet-wadding to the operating table with strong safety pins. Conservation of body heat is of prime importance in these debilitated, dehydrated babies, and supplemental heat is provided in the form of hot water bottles, one on either side of each lower extremity and one beneath the small of the back. A number 10 or 12 F. catheter is passed through the nose to the stomach so that aspiration may be completed before anesthesia is commenced. The tube is left in place throughout the operation, and any gas that might accumulate during the operation can be readily expressed by the surgeon. By and large, ether is the anesthetic agent of choice except in institutions where a trained anesthetist is not available. In such instance, much can be said in favor of local anesthesia.

If ether is used as a part of skin preparation, care must be taken to prevent puddling beneath the baby's buttocks. The baby's tender skin can be burned with ether, and blistering can be a real nuisance during the period of recovery.

The incision preferred varies with the surgeon performing the operation. A short right rectus incision, placed high over the right lobe of the liver, is that preferred by most surgeons. The right lobe of the liver is gently retracted superiorward, and the index finger inserted into the abdomen readily verifies the diagnosis by palpation of the pyloric tumor. All intra-abdominal maneuvers are carried out with instruments which require less room than fingers.

The pylorus is delivered through the wound by gentle traction, care being taken not to drag heavily on the celiac plexus, then grasped between the thumb and forefinger of the operator. The zone of least vascularity on the anterior superior surface of the pylorus is selected, and a longitudinal incision through the serosa and superficial musculature is made. A small hemostatic forceps is used to divide the gristly muscle fibers to a point where the mucosa herniates through the pyloric wound up to the level of the serosa. The use of a binocular loupe as a visual aid at this stage of the operation will permit more accurate division of all fibers and lessen the hazard of duodenal perforation. Too, it will assist in prompt recognition of this accident, should it occur.

It is well to remember the pyloric tumor protrudes

into the duodenal lumen in a fashion analogous to the cervix protruding into the vagina. It is at this point, where the mucosa folds upon itself, that perforation will invariably occur when the operator is too energetic in splitting the duodenal end of the tumor. Robertson¹² claims it is not necessary to divide every last strand of muscle fiber in this precarious recess; he believes such a practice will not influence the incidence of postoperative recurrence. This view is not universally accepted, however. Obviously, accidental perforation must be recognized and treated, for failure to do so will result in death from peritonitis. Gentle pressure on the stomach will often force the escape of gas and stain the mucosa with bile when perforation has been committed.

Immediate closure with one or two sutures of fine arterial silk or chromic catgut is indicated. Some surgeons prefer to reinforce the rent with a tab of omentum or fat as an additional precaution. After hemostasis has been demonstrated, the pylorus is dropped back into the abdominal cavity and the liver is allowed to return to its original position. The abdomen is closed in layers with suture material of the surgeon's choice. It should be emphasized, however, that fine suture material yields more satisfactory wound healing. Ladd et al.⁶ write they have found silk more satisfactory than catgut in 1,145 operated cases.

Postoperative vomiting will be minimized if the stomach is aspirated at the termination of the operation. If it appears there will be need for repeated gastric aspirations, the tube is simply left in place.

After care should include physical facilities permitting accurate temperature control and the prevention of crossed infections. Parenteral fluids are administered in amounts sufficient to supplement oral intake and maintain hydration. Eighty to 100 cc. by hypodermoclysis each day for three days is usually ample. A standard postoperative feeding program is desirable in order that interns, nurses, and ward attendants know what is expected. I do not believe it wise to permit handling of the infant without necessity until after the fourth or fifth postoperative day.

COMPLICATIONS

The most frequent complication during operation is perforation of the duodenal mucosa, and its prompt recognition and immediate repair are mandatory to preserve the life of the patient. These patients should be kept on constant gastric suction for 36 to 72 hours after operation and maintained on parenteral fluids. Ladd et al. opened the duodenum 23 times in 1,145 patients, but in all cases the accident was discovered and repaired immediately. In no case was there any untoward effect. It seems apparent that accidental per-

foration which is repaired promptly in the recommended fashion adds little hazard.

A disturbing situation arises when the operation is incomplete and sufficient strands of pyloric tumor remain to cause persistent stenosis of the pylorus. These patients require reoperation at the earliest possible moment with division of the remaining fibers of pyloric muscle to relieve the obstruction. In every case with persistent symptoms, incomplete operation should be corrected immediately as prompt reoperation richly increases the infant's chance for survival.

Wound infections are common, but the incidence varies widely from one clinic to another. Ladd et al. had an incidence of 2.9 per cent in 380 operated cases, whereas Nafe⁹ reported 10 per cent of his 129 cases "drained during the postoperative period." Wound dehiscence, with or without evisceration, incisional hernia, and hemorrhage are less commonly encountered complications.

Gastroenteritis is by far the most dreaded complication and the most common cause of death. Looseness of stools during the postoperative period is a signal for prompt measures to bring about its control. Second only to gastroenteritis as causes of death during the postoperative period are pulmonary atelectasis, peritonitis, and bronchopneumonia.

DISCUSSION

Poor results with early pyloromyotomy in congenital hypertrophic pyloric stenosis are generally caused by inadequate knowledge of fluid and electrolyte balance. This problem having been overcome, it is now unusual for patients to have anything but a smooth postoperative course, and the family can be assured there will be no ill effects in later life. In other words, the cure is complete! Furthermore, the steady downward trend of mortality figures in recent years lends support to the assertion the operation is a relatively safe one. In skilled hands, the classical operation combined with adequate preoperative preparation yields a mortality rate of less than 3 per cent.

Levi⁷ reported 100 consecutive cases of breast-fed infants who underwent pyloromyotomy without a single death; in the same period 46 bottle-fed babies were operated upon with five deaths, all from gastroenteritis. Donovan,² analyzing 507 cases treated with pyloromyotomy at Babies Hospital, New York, reported a mortality rate of 1.8 per cent with only two deaths in 389 cases treated during the period 1932-1946. With regard to the almost prohibitive mortality rate at the turn of the century, it has been said that in no other field of surgical endeavor has there been such a remarkable diminution in mortality statistics over a comparable period of time.

Wollstein¹⁵ made a special study of healing after

pyloromyotomy. Using 23 necropsy specimens obtained between 24 hours and two years following operation, she determined that healing after operation is brought about by cells in the serosa and submucosa. She found the unstriated muscle of the pylorus plays no role at all in the process. Healing is complete in nine days in the pyloric wound, and the pyloric aperture is completely relaxed in two weeks. Within one month the stomach has returned to normal size, and the gap between the ends of divided muscle has practically disappeared by the end of the sixth week. When the patient reaches his second year, only a thin line of connective tissue separates the muscle ends, and the stomach is entirely normal. She concluded pyloromyotomy cures the pyloric tumor.

In 1951 Armitage and Rhind¹ reported gastric resection for perforating gastrojejunal ulcer in a 41-year-old man whose hypertrophic pyloric stenosis had been treated by gastroenterostomy at the age of 2 months. The resected specimen afforded an opportunity to examine the pylorus, and it was found that hypertrophy had persisted since infancy.

Walters¹⁴ reported five cases in which severe gastrointestinal hemorrhage from ulcerated gastrojejunitis occurred 18 to 30 years after gastroenterostomy for congenital hypertrophic pyloric stenosis. All of his patients were treated by gastric resection, and all of the specimens revealed persistent stenosis at the point of obstruction of the pylorus.

From these reports one might conclude that in a given case of congenital hypertrophic pyloric stenosis the tumor will persist throughout life, to a degree, unless the muscle fibers are divided as in the Fredet-Rammstedt pyloromyotomy. In my opinion, the foregoing data leaves little room for medical management once the diagnosis has been established.

SUMMARY AND CONCLUSIONS

Results of surgical treatment in 36 cases of congenital hypertrophic pyloric stenosis have been presented. The material represents the experience of 11 different surgeons at Bethany, Providence, and St. Margaret's Hospitals, Kansas City, over a 10 year period, 1946-1955.

Males predominated over females by a ratio of 3.5:1, and the average age at the onset of symptoms was 23.7 days. Twenty-nine infants were formula-fed; only seven were breast-fed. Projectile vomiting was present preoperatively in all infants, and 41.6 per cent demonstrated an olive-sized tumor in the abdomen. Inhalation anesthesia was the anesthesia of choice (66.6 per cent) and a high right rectus incision was used in the majority of instances. The duodenum was inadvertently opened during the course of pyloromyotomy in six cases, an incidence of 16.6

per cent. Eighty-three per cent of patients vomited during the postoperative period, and the stomachs of all babies who did not vomit had been aspirated.

There were two deaths in this series, giving a mortality rate of 5.5 per cent. One patient succumbed to generalized peritonitis and multiple pulmonary abscesses secondary to accidental undiscovered laceration of the jejunum at operation. The second death was from post infectious purpura hemorrhagica in a patient who developed a severe upper respiratory tract infection during the immediate postoperative period. Of the 34 surviving patients, cure was rapid and complete. Patients were dismissed from the hospital after pyloromyotomy at an average of 10.4 days.

Surgical treatment of congenital hypertrophic pyloric stenosis should be carried out as soon as the patient's condition will permit. Pyloric stenosis will persist throughout life if pyloromyotomy is not performed. The operation is a safe one and cures the pyloric tumor.

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Trichobezoar

Report of a Case Involving the Stomach, Duodenum, and Jejunum in a Six-Year-Old Girl

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The following case is presented in order to show an unusual pathological specimen and interesting radiologic findings.

The patient is a six-year-old girl who was seen because of vague pains in her abdomen. For a year prior to this she had been a poor eater and had failed to maintain a normal weight for her age and height. She had had a successful operation for a ruptured appendix at the age of three. She had always been a suspicious withdrawn child, and her family had never been able to discipline or train her with good results. Up until four months before the onset of the present illness she had had a nervous habit of biting her fingernails and pulling bits of hair from her head and chewing them.

On physical examination a large, non-tender, movable mass was palpated in the epigastrium; there were

no other abnormal findings. Her blood count revealed a white blood count of 16,500, red blood count of 4,100,000, hemoglobin 68%, differential count, polys 61, lymphs 34, eosinophils 1, monos 4. The sedimentation rate was 25 millimeters in an hour, Westergreen. Urinalysis showed a specific gravity 1,001; albumin, sugar, and microscopic examinations were negative. The clinical impression prior to x-ray was that of a neoplasm, probably a lymphoma, Wilm's tumor, or neuroblastoma.

The x-ray examination revealed no evidence of pathology within the barium enema study with the

In the case reported, physical examination and radiological studies gave evidence of a mass lying superior to the transverse colon. Surgical findings are described.



Figure 1. Film taken two hours after ingestion of meal reveals barium-impregnated bezoar in the stomach and jejunum.



Figure 2. Photograph of the operative specimen.

of barium revealed a huge filling defect. Since the barium filtered into the surface of the filling defect, the diagnosis was trichobezoar. There was no obstruction to the ingested barium.

The irregular filling defect was also seen to extend into the duodenal cap and as far as the proximal jejunum. A two-hour follow up examination revealed the stomach empty of barium except for that impregnated in the large hair ball. It was our conclusion that the child had a large trichobezoar of the stomach, duodenum, and proximal jejunum.

On January 31, 1956, a gastrotomy was performed and a large trichobezoar forming a cast of the stomach, duodenum, and proximal jejunum was extracted. The postoperative course was uneventful.

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Rehabilitation

Restoration of Function after Fractures Is an Important and Sometimes Neglected Feature of Their Treatment

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A group of unfortunate late sequelae complicate the end results of various fractures. Some of these have been mentioned in previous sections when they were especially pertinent to the particular injury under discussion. Because of their importance, they are now brought together for consideration as complications common to more than one fracture and productive of severe and often permanent disability. These late complications which beset the path of the fracture surgeon and his patient are considered below.

LIMITED JOINT MOTION

Joint motion may be restricted by one of the following mechanisms: (1) intracapsular adhesions, (2) extracapsular soft tissue contractures, (3) adhesion of muscle to bone at a distance from the involved joint, and (4) mechanical disruption of the joint surface secondary to failure to restore anatomic alignment of the joint.

The severity and the significance of the complication depend upon the joint involved and the mechanism productive of limitation of joint motion. Where possible, prevention of this complication is the best treatment. One of the major advantages of rigid internal fixation with respect to fractures of the shaft of the femur and subtrochanteric and intertrochanteric fractures of the femur in elderly individuals is the preservation of motion in the knee and hip and the avoidance of late contractures with loss of extension at the knee. Early mobilization of adjacent joints

is a dividend of skillfully performed rigid internal fixation.

Where limitation of joint motion was not or could not be prevented, restoration of function must be considered. In analyzing the approach to an individual problem, the first consideration must be the actual disability that incurs to the patient as a result of limited motion. Limited motion at the shoulder

This is the concluding installment of a four-part series which began in the Journal for July. Other parts were published in the issues for August and September.

or elbow may result in comparatively little actual disability to the patient, particularly if the functional arc of motion is retained. The last 30 degrees of extension at the elbow are of little significance and do not warrant major attempts to restore full range of motion. On the other hand, loss of the last 30 degrees of extension at the knee constitutes a major disability and warrants serious effort to restore the lost range of motion.

The second factor that must be considered is the mechanism productive of the restricted motion. Intracapsular adhesions are amenable to gentle stretching, preferably carried out over a long period of time as consistent, active exercise by the patient under the

direction of the surgeon or a competent physical therapist. Rough, forceful stretching or tearing of intracapsular or extracapsular adhesions will result in hemorrhage with organization of the traumatized parts, further scar formation, and persistent contraction. Mechanical devices with a constant corrective force are frequently a major help in stretching soft tissue contractures.

Surgical release of contractures must occasionally be considered where more conservative efforts are doomed to failure. Old areas of heavy capsular fibrosis or extensive scarring of soft tissue with incarceration of the tendons about the hand are difficult problems, and it may be impossible to restore the normal gliding motion in this intricate piece of machinery. Quadriceps adhesion to the anterior femur is a fairly common complication of supracondylar fractures of the femur. The restriction of flexion of the knee results from check-rein effect of the adherent distal quadriceps and the patellar tendon. Motion may sometimes be restored across the knee by a quadriceps-plasty with sacrifice of some strength of the quadriceps to regain an increased range of flexion across the knee. Conversely, extension of the knee joint may be regained by subperiosteal capsulotomy with lengthening of the hamstring tendons. Forceful wedging or manipulation of a knee flexion deformity is to be condemned since it frequently results in posterior subluxation of the tibia on the femur.

NERVE DAMAGE

Damage to the central or peripheral nervous system may result directly from the fracture in question, as an indirect complication of the treatment of the fracture, or as a late sequela of specific fractures.

Direct injury to the nervous system may complicate fractures involving the vertebral column. Neurological damage is most prone to occur in vertebral fractures above the level of the first lumbar vertebra where the spinal cord tends to fill the neural canal. Any injury which results in transient or permanent encroachment upon the neural canal may produce damage to the contents of the canal. The treatment of this major complication is complex and frequently demands the skills of the neurosurgeon, the urologist, the internist, and the physical therapist, in addition to conscientious and constant nursing care.

Immediate total paraplegia associated with fracture or fracture dislocation in the thoracic or cervical spine carries a poor prognosis. Transportation of the patient must be carried out with skill and gentleness, and the patient must be maintained in a neutral position until the mechanism of cord injury is determined and means for proper treatment are at hand. Immediate treatment is directed toward relief of spinal cord compression.

If manometric tests indicate a block, and if physical and x-ray examination corroborate this finding, it is mandatory that the compression be relieved. This may be accomplished by closed reduction of the fracture or dislocation; by hyperextension in case of thoracic vertebra, or traction with skull tongs in the case of fractures of the cervical spine; or open reduction with or without laminectomy. Open reduction is the treatment of choice with a compression fracture associated with complete forward dislocation of the superior vertebra with locking of the articular facets. Hyperextension in this injury will increase cord compression and is contraindicated.

Open reduction may also be necessary in injuries which have resulted in fragmentation of the posterior elements with displacement of bony fragments into the neural canal. Laminectomy is indicated early in those injuries in which there is evidence of a block that cannot be reduced feasibly and quickly by other means. The decision on immediate treatment is frequently difficult to make. The late psychological attitude of the paraplegic or quadriplegic patient must also be considered; if a doubt exists as to the indication of laminectomy, this consideration may tip the scales in favor of laminectomy. Where possible the counsel of an experienced neurosurgeon is to be obtained.

The late rehabilitation of the permanent paraplegic patient is another subject. This frequently is accomplished best in centers designed and equipped for that purpose. Early in the injury one must establish efficient bladder drainage and frequent turning of the patient in order to minimize urinary tract infection, urinary calculi, and the ever present menace of decubiti.

A second common direct nerve injury secondary to fractures is radial nerve damage associated with fractures of the shaft of the humerus. This complication is a result of the close proximity of the radial nerve to the middle third of the shaft of the humerus as it winds around the bone from the posterior to the anterior compartment of the arm. If spontaneous improvement does not occur, radial nerve function may sometimes be restored by neurolysis in those instances where continuity is not disrupted; or some gain may be obtained by neurotomy when the nerve is divided.

Where these neurosurgical procedures fail, restoration of extensor function to the thumb and fingers can be partially achieved by transplantation of the wrist flexors to the extensor tendons. Wrist drop is best corrected by arthrodesis in the position of function.

The disability of peroneal nerve palsy may also be partially alleviated by arthrodesis of ankle joint to correct a drop foot. This provides a painless, stable joint with minimal disability and a satisfactory gait.

It eliminates the need for a brace and is compatible with a practically normal gait.

Lateral instability of the foot may be overcome with a triple arthrodesis stabilizing the subtalar joint, and this may be combined with an ankle fusion with good functional results.

Late neural complications of fractures are typified by the tardy ulnar nerve paralysis which may occur years after a fracture involving the elbow in childhood. Growth disturbances resulting in a cubitus valgus deformity will slowly produce a stretch deformity of the ulnar nerve resulting in late ulnar nerve palsy. This may be corrected by transplanting the ulnar nerve anterior to the medial epicondyle, thus shortening the route traversed by the nerve.

A painful median nerve neuritis may result from narrowing of the anterior carpal tunnel, secondary to deformity from an old Colles' fracture. There may also be loss of function of the motor branch of the median nerve with loss of opposition and abduction of the thumb. This complication can be corrected by the comparatively simple operation of division of the anterior carpal ligament. With decompression of the median nerve, function is usually rapidly restored.

ISCHEMIC CONTRACTURE

Circulatory embarrassment may complicate fractures of either the upper or lower extremity. It may be a complication of treatment rather than one resulting from the original trauma. In its most virulent form it will result in ischemic necrosis of the soft tissue and may end in severe permanent disability or amputation of the involved part. The lesion results from impairment of arterial blood supply, and in the upper extremity it may produce a typical syndrome, the end result of which is known as Volkmann's ischemic contracture.

This entity is pathologically an ischemic necrosis of muscle and nerve involving the flexor surface of the forearm with secondary contracture of the flexor muscle mass resulting in a flexion deformity of the wrist, clawing of the fingers, and variable degrees of sensory loss. As with many other complications in the treatment of fractures, prevention is the key to treatment. The complication is most prone to occur in treatment of supracondylar fractures of the humerus in children. It is this possible end result which makes it mandatory that a palpable radial pulse be present at the close of manipulation of a supracondylar fracture. If the degree of flexion at the elbow is sufficient to obliterate the radial pulse, the elbow must be extended again to the point where the pulse becomes palpable even though this may mean some loss of reduction.

If reduction cannot be maintained along with ade-

quate circulation, traction becomes the treatment of choice, utilizing either skin traction with the elbow partially extended or skeletal traction with a Kirschner wire through the olecranon. Rehabilitation following Volkmann's ischemic contracture generally produces unsatisfactory results, with the final disability being proportional to that present at the beginning of treatment. Partial carpectomy with shortening of the forearm may be of value in releasing the contracted soft part. Wrist fusion and tendon transplants in selected cases may be of help in restoring function to the hand.

Bryant's traction in the treatment of fractures of the shaft of the femur in children is frequently not recognized as a potential source of ischemic contracture. Bryant's overhead traction is almost a universal form of treatment for fractures of the femoral shaft in patients under the age of five or six years. It is in general safe and is productive of excellent end results. It may, however, be complicated by obliteration of the popliteal artery if the knee is hyperextended in the position of traction. It is imperative that the circulatory status of the extremity distal to the knee be inspected at frequent intervals after the initial application of Bryant's traction. If the traction is in alignment in such a manner that the knee is in a position of slight flexion, there will be little chance of obliteration of the popliteal vessel.

OSTEOMYELITIS

Antibiotics have been of great help in preventing and treating infections following trauma. This fact, however, does not eliminate the threat of osteomyelitis as a complication in the treatment of compound fractures, nor does it eliminate the possibility of disaster following elective open procedures on closed fractures.

The initial treatment of a compound fracture is the most important factor in the prevention of infection. This is a matter of urgency. The first step after diagnosis and assessing the wound is to convert the wound as nearly as possible to a surgically clean wound. If this can be accomplished during the period of contamination but before the development of active infection, the wound may be considered for primary closure. In general, if a primary closure can be satisfactorily obtained, a better end result can be anticipated. It is of course not feasible to close a potentially infected compound fracture, and if it is not possible to obtain a surgically clean and debrided wound within a period of 6 to 12 hours after the injury, the wound should be left open and considered for secondary closure at a later date.

A second potential source of osteomyelitis associated with fractures is that which results from open elective procedures on closed fractures. It is a disaster to the surgeon as well as to the patient to convert a relatively simple problem of a closed fracture into an open

draining wound usually associated with nonunion and deformity of the bone with a secondary soft part deformity. This possible complication must always be weighed in the balance of the surgeon's thought when considering the feasibility of open versus closed treatment.

When confronted with established osteomyelitis complicating a fracture in an extremity, the physician must decide on treatment after consideration of the following factors: the site of infection; the extent of damage; the adequacy of skin covering; the organism and its susceptibility to antibiotics; the extent of union; the extent of systemic symptoms; the location; the duration; and the patient's wishes. Rehabilitation may be a prolonged and sometimes unrewarding process marked by numerous operations with pedicle or cross leg skin flaps, bone grafting, sequestrectomy, incision and drainage procedures, ultimately to result in amputation. The wisdom and experience of the surgeon will be taxed by such a problem, and a wise course in protecting both the surgeon and the patient will be to obtain consultation in specific instances of severe disability.

DECUBITI

A point of pressure over a bony prominence may develop either within a cast or in the course of bed rest, with secondary necrosis of the skin and soft tissues. This results in a decubitus ulcer which is usually infected and slow to heal, and the patient may focus his attention on the ulcer in spite of perfect union and function obtained in the treatment of the original injury.

A possible decubitus is always to be suspected when a patient in a cast complains of burning pain or a sensation of pressure over a bony prominence. The development of this complication is also to be feared in elderly individuals who are subjected to prolonged bed rest, particularly if they are in traction or other apparatus which prevents frequent change of position. The ulcer, once present, demands immediate relief from further pressure. Debridement is indicated in the presence of necrosis of skin and subcutaneous tissues, particularly when complicated by secondary infection. The use of any bland antibiotic ointment may be undertaken after relief of pressure and debridement of necrotic tissue. Plastic procedures may be necessary to obtain final closure of the ulcer.

PSYCHIC COMPLICATIONS OF FRACTURES

The surgeon may be forcibly reminded that he is treating an individual with a broken arm or broken leg rather than treating only a fracture. The motivation of a patient, the orientation, the basic fears and pride will frequently be determining factors in the end results. Cooperation, determination, and intelligence on the part of the patient are strong allies in the treatment of any injury. The presence of fear,

false pride, or an inadequate personality may jeopardize the best efforts of the surgeon. These factors are treated and influenced by the ill defined but powerful factor of personal relationship between the surgeon and patient.

A sometimes pernicious, psychic influence in the treatment of fractures is that disease entity known as "compensationitis." Where the patient is influenced by a desire to obtain a monetary reward, or where consciously or unconsciously he lacks the driving force to return to his previous status and to make the most of the function available and to make the least of his complaints, the end result will be deleteriously affected. Again the personality and influence of the physician will be a factor in overcoming the patient's tendency to dwell on his disability and to minimize the functional capacity that remains.

FRACTURES IN CHILDREN

In the broad field of fracture rehabilitation, a separate note should be made regarding a difference in approach to the problem of fractures in adults as compared to the same injuries in children. Similar injuries in individuals of different age levels involve entirely dissimilar factors due to the presence of rapid healing in childhood and the influence of growth. Open reduction is rarely indicated in fractures of the long bones of children except for specific fractures. Fractures about the elbow joint involving the epiphysis, such as the head of the radius or the lateral condyle of the humerus, may require open reduction and anatomical reposition. The head of the radius should never be excised during its growth period. The same is true of the lateral condyle of the humerus.

Extensive physical therapy is rarely required in fractures in children. Restoration of motion is accomplished with greater ease and with normal active function on the part of the child. One may usually accept reductions that are less than anatomical in fractures in children. Rotational deviation should be corrected, and anatomical reduction of epiphyseal injuries is to be desired. Observation throughout the growth period is required when there is a possibility of deformity developing secondary to epiphyseal injury.

SUMMARY

The rehabilitation of the fracture patient is a broad field which involves many separate disciplines in the field of medicine. It may produce challenging problems and, at times, insurmountable difficulties with end results less than those desired. It offers the reward of accomplishment in the face of difficulties and provides a satisfying sense of achievement both to the patient and to the surgeon in charge.

The Wichita Clinic
3244 East Douglas
Wichita 8, Kansas



"In the last one or two decades we have got so into the habit of considering the tendency to fatal termination of a lesion, and overlooking the clinical or symptomatic and disturbing elements of the lesion, that we have forgotten the patient almost entirely. In other words, the school of pathology did not carry along with it the desire and the training for the relief of the symptoms of the patient as it progressed in its efforts to relieve him of the pathologic condition. It is hardly necessary for me to say to you that patients come to us for the relief of symptoms, for the relief of pain, discomfort, and annoyance, and a patient from whom you have removed a carcinoma of the pylorus is not so grateful to you for the result as is the man who has had an ingrowing toenail successfully removed. This is an absolute truth, and I think in that particular we have been negligent in considering the comfort of our patients both before and after operation. . . .

"This man has a dragging sensation in his scrotum. [He had a varicocele.—Ed.] He has pain in his back. He has discomfort, and when night comes he has one ache in his scrotum until the morning, and to him it is just as important to relieve that pain as it would be to relieve the pain and discomfort which are always less in the case of sarcoma of the testicle and elsewhere, and in handling these cases we must be more considerate for the patient's ills and pains and aches. In my mind, a lack of this consideration is the reason why all the cults of medicine have originated. I believe this, that the regular family doctor is always the first choice, and it is only after his shortcomings have been grossly accentuated by his inefficiency that anybody else is called up for relief. The next decade is going to bring a constant and forceful current on the relief of the symptoms

of a patient, as well as relief from the gross pathologic entity which in some cases is discernible, but in a large percentage of cases is not."

Advances in anesthesia, general availability of blood transfusions and more efficient control of infection by antibiotics have extended the field of "safe" surgery to an extent almost unimaginable even a few years ago. As a result we are participants in an era which puts the emphasis on heroic or sensational surgical procedures such as mitral commissurotomy, aortic grafting, pancreatico-duodenectomy, pneumonectomy, the separation of Siamese twins, and the like. Have we, in the course of our "progress," neglected the more common individual who has a simple, benign, curable (but uncomfortable) disease process for which he needs "relief of pain, discomfort, and annoyance"? A comparison comes to mind in wartime experiences when the "slightly wounded" soldier, having no demand on priority, was apt to be kept waiting a long time for his surgery, even to the point of developing complications which prolonged disability, although by good treatment carried out early he could usually be returned to full duty soon. Of course, we said (and correctly) that "we can't treat them all at once," and the severely injured *did* need earlier help to save life. None-the-less we should not lose sight of the fact that the relief of discomfort due to an ingrown toenail will be important to the person who has it—and he will be grateful.

But who, you ask, made the statement quoted earlier? It was not so "new" as might have been supposed, having been made by John B. Murphy* in one of his famous clinics, in 1911—45 years ago!—O. R. C.

* W. B. Saunders Co., The Surgical Clinics of John B. Murphy (1912).

PRESIDENT'S PAGE

DEAR DOCTOR:

During the past month I have participated in numerous activities. I have met wonderful people and heard many interesting discussions. A day away from my office is usually rewarded by some unusual talk or person.

I have been interested in medical public relations for several years and have known for a long time that many of you are most capable performers in this field. Physicians are rather reticent about appearing before the public, but whenever they do they are usually most successful.

Recently I heard a member of our Society deliver a lecture on his trip to Russia. As I listened to his remarks I was again reminded of this wonderful country in which we live. We do not appreciate enough our freedoms such as the right to worship, school system, free enterprise, freedom of speech, and many others. What more can we do to preserve this democracy? Respect the rights that we have, know more about political issues, be active in community affairs, and exercise our right to vote when given the opportunity, thus having an integral part in this wonderful country.

Fraternally,

Clyde H. Miller M.D.

President

P.S. Be sure to exercise your voting right.

EDITORIAL COMMENT

Care for Military Dependents

The passage of Public Law 569 of the 84th Congress and its signature by President Eisenhower on June 7, 1956, may be one of the most significant health activities on the part of the federal government during the last decade. This law provides limited medical and hospital care for the dependents of servicemen. The act is known as the "Dependents' Medical Care Act."

This short act of only five pages defines a serviceman as a member of any uniformed service who is on duty for a period of more than 30 days. His dependents are wife, unremarried widow, unmarried children who are less than 21 years of age, parents or parents-in-law under certain circumstances, etc. Such dependents have previously been eligible to receive care in a service hospital. As a result of this act, which becomes effective on December 7, 1956, these dependents may receive limited medical care and hospitalization from civilian sources.

Regulations are still being formulated, but in general service facilities shall not be expanded but they shall be efficiently used. However, dependents not living with their serviceman may choose either the service hospital or civilian facilities. Dependents who live with the serviceman may generally use civilian facilities if service hospitals are crowded, and in the case of obstetrics they have their choice.

Care to which dependents are eligible is limited to include diagnosis, the treatment of acute medical and surgical conditions, the treatment of contagious diseases, immunizations, and maternity and infant care. The above are authorized generally if care is rendered in a licensed hospital. Not authorized is hospitalization in any nursing home, or any service principally requiring domiciliary care. Also not authorized are those services normally thought of as out-patient services. Excluded also are treatment for nervous and mental diseases, any chronic diseases, or a surgical procedure which is not a medical necessity. Not authorized are ambulance service, home calls, or dental care. Dependents may not receive prosthetic devices, hearing aids, orthopedic footwear, or spectacles.

Hospitalization in semi-private accommodations is authorized up to 365 days for each admission and includes all supplies and equipment, diagnostic procedures, and services that may be necessary. The patient is charged either \$25 for each admission or \$1.75 per day, whichever charge is the greater. That is to be paid directly to the hospital. The remainder will be paid by the government.

A tentative definition of a physician is a person who is legally qualified to prescribe and administer all drugs and to perform all surgical procedures.

According to terms of the act, the Department of Defense will negotiate with the Kansas Medical Society. The Society will submit a fee schedule which is being prepared by the Fee Schedule Committee and by the Council. The fee schedule is to be a realistic schedule of prevalent rates in Kansas. Care for dependents is not to be given for reduced payment, but neither does the government expect to pay a premium. Fees are to be realistic and are not necessarily based upon any other schedule in existence. The Society has already received a standard nomenclature consisting of 1,600 separate items for which fees shall be established.

Until this program is in operation, one can only guess the effect it will have upon the practice of medicine in this state. The present guess is that the effect will be barely noticeable. It is believed that many dependents of servicemen will continue to seek care at service hospitals and that the principal effect will be noticed in Kansas communities such as Hutchinson, Junction City, Olathe, Salina, Topeka, and Wichita, where military installations exist. Elsewhere, there will be an occasional instance of a dependent not living with a serviceman who will seek home town care. All in all, it appears the effect of this program will be slight, EXCEPT FOR THE PRECEDENT. THIS SETS THE STAGE FOR THE FUTURE.

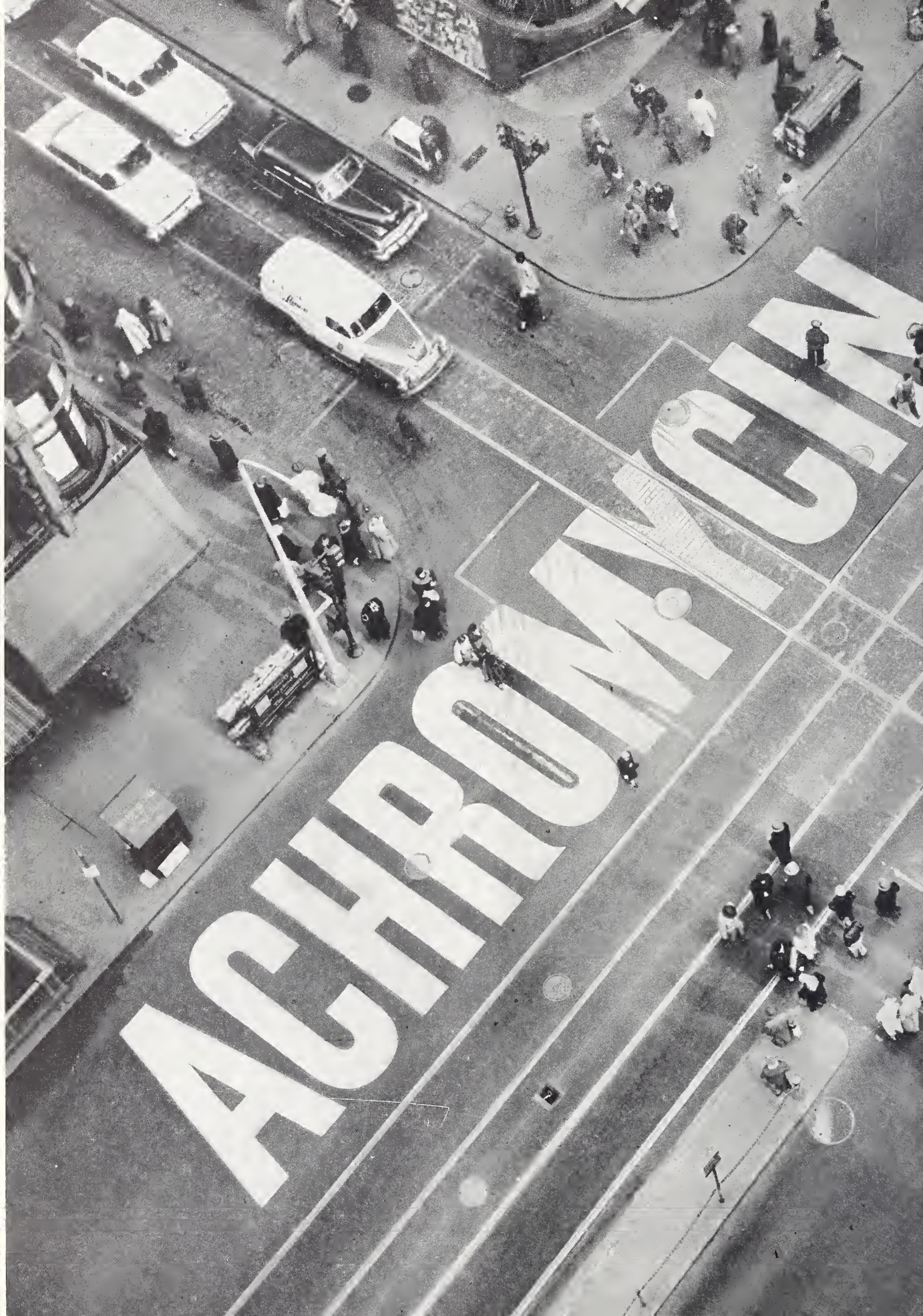
The government has set a basis upon which it proposes to purchase medical care. It has selected to negotiate with organized medicine. It has asked, in effect, for a formula under which the doctor will provide care to whoever the government lists as its dependents.

The program had better be worked out with care because the doctors might well find themselves living under that formula for a long time to come.

The Journal Grows

Our September JOURNAL, which contained an even hundred pages, was the largest issue we've ever published. There's no merit in bigness alone, and an issue of that size was never an objective—it just happened. But we do feel that a milestone has been reached.

Most commercial publications base the number of pages for a particular issue on the amount of advertising that issue will carry. It's only good business to keep costs in line with revenue. But the JOURNAL, operating on a non-profit basis, makes no attempt to preserve an advertising-text ratio. We schedule material for publication in a certain issue





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¹Posner, A. C., *et al.*; Further Observations on the Use of Tetracycline Hydrochloride in Prophylaxis and Treatment of Obstetric Infections, *Antibiotics Annual* 1954-55, pp. 594-598.



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*REG. U.S. PAT. OFF.

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without regard for the income to be received. It usually works out that the loss on a text-heavy issue is balanced by gain on another issue that is more lucrative. In the past ten years, the biggest issue of any year was the one carrying the most pages of advertising in only three instances.

In the years just before World War II, an issue of the JOURNAL routinely contained 52 pages. During the war, when advertisers wished to contract for more space, the size of issues was restricted by the amount of paper available, so some advertising contracts were rejected and the size of issues was usually held to the customary 52 pages. As paper supplies increased, so did the number of JOURNAL pages. A study of issue sizes during the past ten years shows the rate of JOURNAL growth.

In 1947 and 1948, the six largest issues were of 72-page size; the smallest two carried 60 pages each. The maximum in 1949 was 80 pages, and the minimum was 68. The range between extremes in 1950 was even greater, 88 pages in the biggest issue and 60 in the smallest. The high in 1951 was 84, and the low was 64.

During the past five years only eight issues have carried fewer than 72 pages, one issue each in 1951, 1953, and 1955, two in 1954, and three in 1952. In 1951 the maximum was 84 pages; in 1952, 80 pages; in 1953 and 1954, 84 pages; in 1955, 92 pages.

No seasonal pattern is evident in a study of these statistics. The biggest issue of the year did not consistently fall in any month or at any special time of year. The calendar seemed to have nothing to do either with the smallest issue of the year. December was distinctive during the past ten years in that it did not appear in either the largest issue or smallest issue column, and other months appeared in both.

Where do we go from here? We don't know, but we hope that the bigger JOURNAL has added to the interest and pleasure of its readers. And, just in case this discussion of size makes some reader curious about the number of pages in this issue, we'll give you the answer. This is printed on one of 92 pages in our October issue.

Rural Health Conference in Kansas

The Kansas Medical Society, which will celebrate in 1959 on the occasion of its 100th anniversary, will have occasion to make the year even more memorable by serving as host to a national meeting early that year. The Fourteenth National Conference on Rural Health will be held at Wichita, with headquarters at the Broadview Hotel, March 5-7. Members of the Sedgwick County Medical Society will join the state organization as hosts.

The Council on Rural Health of the American Medical Association is composed of ten physicians. Its advisory committee is made up of ten lay persons, both men and women, representing the American Farm Bureau, the Farm Foundation, the National Grange, home demonstration units, agricultural extension services, and the farm press. Mr. Aubrey D. Gates, who attended the 1956 meetings of the Kansas House of Delegates to receive the Kansas invitation for the 1959 conference, is field director of the A.M.A. council.

Through the 15 years of its existence, the council has worked to improve the health of the rural population of the nation by providing a means for exchanging ideas. The conference gives rural people an opportunity to tell what they want and expect in the way of health services, to give constructive criticism, to suggest methods of improving medical care in agricultural areas. It also provides an opportunity for physicians to discuss problems of rural health, services, and objectives, ranging from mental health to preventive medicine, infant care, geriatrics, health insurance, hospitals, etc. Although a formal program is planned for the conference, ample time is allowed for round table discussions in an informal atmosphere.

It is impossible to evaluate results of such a program, and no attempt has ever been made to list the accomplishments of this effort to improve the health of those in our farm communities. But it is apparent that a purpose is served if a better understanding of mutual problems results, if physicians and their rural patients see each other in better perspective. Kansas, as a state that is predominantly rural, is especially interested in this program.

Two Kansans, Dr. Haddon Peck of St. Francis and Dr. Conrad M. Barnes of Seneca, both of whom have served as chairman of the Kansas Medical Society Committee on Rural Health, have taken part in national programs in past years. Dr. Virgil Brown of Sabetha, present chairman of the Kansas group, will go to Purdue University this month to attend a two-day meeting sponsored by the Council on Rural Health of the A.M.A. A program of public relations for rural areas is to be discussed.

The Kansas Medical Society welcomes the opportunity of serving as host for this national meeting. Its officers and members realize that a vast amount of work will go into planning and arrangements, but they are willing to contribute time and effort to this conference which will bring approximately 1,000 persons to Kansas. And, since the meeting will be in their home state, many who have been prevented from attending such sessions in the past because of distance, will be able to be present and participate in 1959.

A RESEARCH MILESTONE

Nilevar*

(BRAND OF NORETHANDROLONE)

Searle's New and Practical Steroid Specifically for Protein Anabolism—

It has long been recognized that a substance which would promote protein anabolism would be of inestimable value in therapy. The androgens have this property, but unfortunately they also exert actions on secondary sex characteristics. These effects are commonly undesirable in therapeutic programs.

THE FIRST STEROID WITH ANABOLIC SPECIFICITY—Nilevar, the newest Searle Research development, therefore, meets a long desired clinical need because Nilevar presents the first steroid primarily anabolic for protein synthesis. Moreover, Nilevar is without prominent androgenic effects (only about one-sixteenth of that exerted by the androgens).

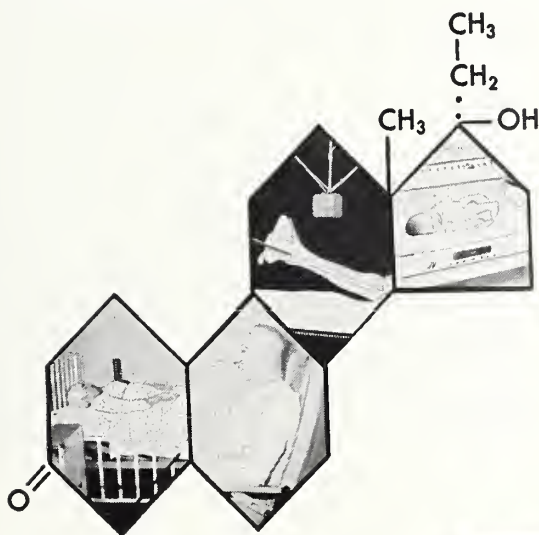
OBJECTIVE AND SUBJECTIVE RESPONSE—Orally effective, Nilevar therapy is characterized by retention of nitrogen, potassium, phosphorus and other electrolytes in ratios indicative of protein anabolism. Moreover, subjectively the patient observes an increase in appetite and sense of well-being.

WELL TOLERATED—Nilevar has an extremely low toxicity. Laboratory animals fail to show toxic effects after six months of continuous administration of high dosages. Nilevar should not be administered to patients with prostatic carcinoma. Nausea or edema may be encountered infrequently. Slight androgenicity may be evidenced on high dosage or in particularly responsive individuals.

MAJOR INDICATIONS—Preparation for and recovery from surgery; supportive treatment of serious illnesses (pneumonia, poliomyelitis, carcinomatosis, tuberculosis); recovery from severe trauma and burns; decubitus ulcers; care of premature infants.

DOSAGE—The daily *adult* dose is three to five Nilevar tablets (30 to 50 mg.) but up to 100 mg. may be administered. For *children* the average daily dose is 1 to 1.5 mg. per kilogram of body weight; individual dosages depend on need and response to therapy.

SUPPLY—Nilevar is available in uncoated, unscored tablets of 10 mg. G. D. Searle & Co., Research in the Service of Medicine.



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SEARLE

Tumor Conference

Report of a Case of Meningioma in Which Complete Cure Is Probable

Edited by **HOWARD P. FINK, M.D.***

Mr. Charles (junior student): This patient is a lefthanded, 42-year-old married airplane factory worker who came in the hospital on March 26, 1956, having been referred by his local doctor because of trouble reading fine print.

He had apparently been well until about three months before when the visual difficulty began. He saw his eye doctor at that time and got a pair of bifocal glasses which apparently corrected his difficulty; he felt well again for about two months, after which he again began having trouble seeing. He went back to his eye doctor, who noticed papilledema and therefore referred him here.

Besides visual difficulty he complained of occasional headaches, which he had had for approximately ten years. They were occipital and suboccipital in location, always aggravated by nervousness, and always relieved by A.S.A. compound. The only recent change in the headaches had been increased frequency. He also gave a history of a six-pound weight loss in the week previous to admission, which he attributed to anorexia caused by worry about his loss of vision.

The past history was insignificant except for slight deafness which he had had for about ten years and which was said to be otosclerotic in type. A careful physical examination was completely negative except for fresh bilateral papilledema. Routine laboratory studies all gave results within normal limits. The chest x-ray was negative.

Question from the floor: Dr. Cashion, how could you tell that the papilledema was fresh?

Dr. Cashion: The swollen nerve head was pinkish and clean looking; there were no hemorrhages and no edema residues. In older papilledema the swelling is more pronounced and the disc is dirty gray; the vessels are engorged and tortuous, and there may be organizing hemorrhages and focal edema in the retina, frequently about the macula.

Dr. Friesen (moderator): Dr. Calkins, when patients come to you and say they have difficulty in reading and want new glasses, what do you do?

Dr. Calkins: If the patient is a 42-year-old man

who had noticed difficulty first with his near vision, the most probable explanation would be presbyopia, and glasses would solve his problem. However, I think any thorough examination of the eyes should always include good visualization of the fundi.

Dr. Friesen: Do you do an ophthalmoscopic examination on every patient who has trouble seeing?

Dr. Calkins: Every patient.

Dr. Friesen: The chances are, then, that this man's first doctor also did, and that the papilledema wasn't present at the first examination.

Dr. Friesen: Dr. Todd, would you show us the x-rays?

Dr. Todd: The antero-posterior projection of the

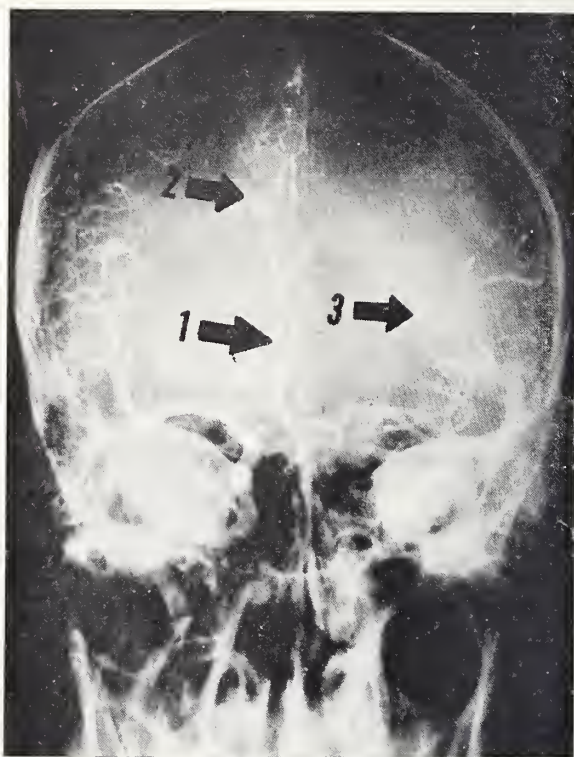
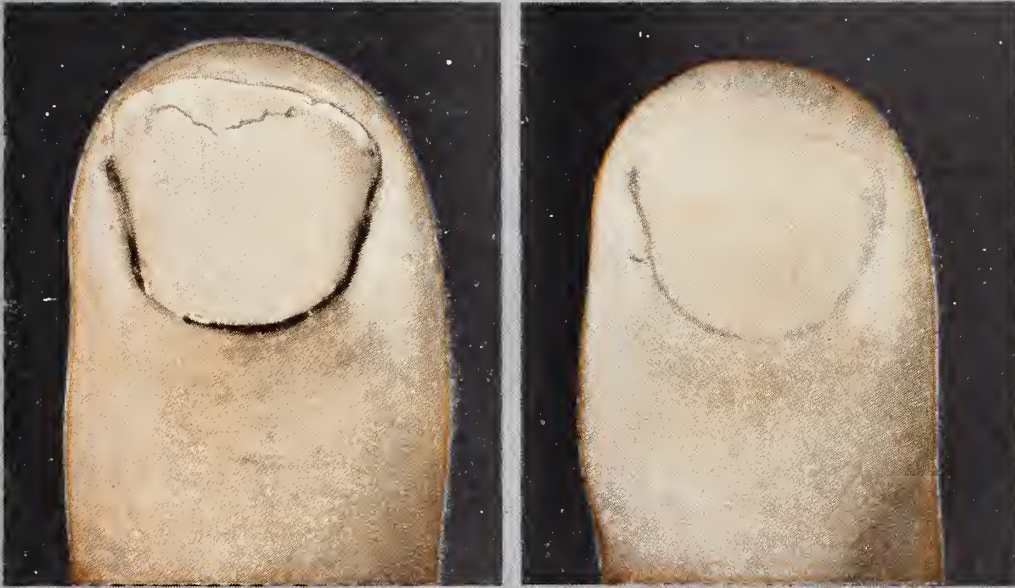


Figure 1. Antero-posterior projection of right cerebral arteriogram, showing (1) shift of the anterior cerebral arteries to the right, (2) shift of the calcified pineal body to the right, and (3) cross-filling of the left middle cerebral artery, which is deflected to the right by the tumor.

*Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Fink is a Trainee of the National Cancer Institute.

KNOX

Protein Previews



New Study Shows Gelatine Restores Brittle Fingernails to Normal

Directions for making the Knox Gelatine drink in every package



Brittle, fragile or laminating fingernails are the bane of many a woman's existence. Yet this highly prevalent and distressing condition often has gone uncontrolled for lack of effective therapy. Now, you can promise these patients substantial relief in a large percentage of cases.

In a recent study¹ that confirmed previous work² Knox Gelatine was used to treat 36 women with fragile, brittle, laminating fingernails. The response was most gratifying. Except for three patients who discontinued the therapy, three diabetics, and two women who had congenital deformities, the splitting ceased and all other patients were able to manicure their nails to a full point by the time the study ended.

Optimal dosage proved to be one envelope (7 grams) of Knox Gelatine administered daily for

three months. Efficacy has not been established with lesser dosage. If you would like more complete details of this work, just use the coupon.

1. Rosenberg, S. and Oster, K. A., "Gelatine in the Treatment of Brittle Nails," *Conn. State Med. J.* 19:171-179, March 1955.
2. Tyson, T. L., *J. Invest. Dermat.* 14:323, May 1950.

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Figure 2. Lateral projection of left cerebral arteriogram, showing smudge of opaque medium (indicated by arrows) remaining in capillaries of tumor after the medium has passed through the arteries.

skull shows a shift of the calcified pineal body to the right. In the arteriograms, both the anterior cerebral arteries are also shifted slightly to the right. The right middle cerebral artery appears normal, but the left middle cerebral artery has an abnormal pattern; it dips medialward at one point (Figure 1). In the lateral projection a fine arteriolar plexus appears in the parieto-temporal region. In the last film, taken after the radiopaque medium had passed through the cerebral vessels, a faint smudge remains in the same area (Figure 2).

Dr. Williamson: Do you think there is increased vascularity in that area?

Dr. Todd: Yes. The smudge represents abnormal capillary filling, probably in a tumor.

Question from the floor: Is it in the right position to push the left middle cerebral artery to the right?

Dr. Williamson: Yes, but only the terminal branches of the artery.

Dr. Todd: The air studies show slight displacement of the anterior horn of the left lateral ventricle, downward and to the right.

Dr. Friesen: Apparently, then, this man's major symptoms were headaches and increasing visual difficulty, and the only significant neurological finding was fresh papilledema. The x-ray studies indicate a tumor. Dr. Williamson, would you discuss this case?

Dr. Williamson: I would like to hammer home three main points. In the first place, this man went to his doctor with the complaint of blurring of near vision, not surprising in view of his 42 years. The doctor put glasses on him and he got better. He also had the same vague, non-specific sort of headaches that many of us have, and he had had them for ten years. But, his doctor had the \$50 necessary to own an ophthalmoscope and the courage to use it; and with it he discovered the patient's papilledema. If someone had not looked inside this man's eyes, the diagnosis of brain tumor would not have been made.

A second procedure available to every general practitioner is a simple x-ray of the skull. This also can establish the diagnosis of an expanding intracranial lesion by showing a shift of the pineal, provided that the pineal is calcified, as it nearly always is after the age of 25.

My third point is that a patient may have a large brain tumor and yet react normally to all neurologic tests. This is a disturbing but important fact to realize. This man's neurologic examination was completely unrevealing, and yet he had a tumor as big as a tennis ball.

These x-rays show well the refinements in brain tumor diagnosis that have been developed in the last few years. Nowadays arteriograms are of primary importance, for they will often outline a tumor accurately. The x-ray findings in this case are characteristic of a meningioma; the arteriograms show an exceedingly vascular space-occupying lesion with a smooth convex border. The mass deforms the ventricles by extrinsic pressure. These x-rays enabled us to make a preoperative diagnosis of meningioma; consequently, we could offer this man an excellent prog-



Figure 3. Arrows define the limits of tumor as it appeared at operation.

Sedatives { A) hypothalamic
Reserpine
B) cortical
Mebaral

A) Indications

1. Emotional instability
2. Anxiety
3. Tension states
 - a) Premenstrual
 - b) Menopausal
 - c) etc.

B) Treatment - Tranquilize!


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Reserpine - Mebaral
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usual dose: 1 tab. tid.

Each tablet contains

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nosis and were also forewarned to have plenty of blood ready.

The operation went smoothly; the tumor was easily exposed and was found to be arising from the dura over the left parietal lobe. It directly overlay the lower part of the motor cortex so that, if this man had been right-handed, he might have been aphasic. The dura bearing the tumor was excised, and the tumor emerged from the wound with only slight help from the surgeons (Figure 3). There was absolutely no surgical damage to the brain. The man was out of bed the day after surgery and went home completely well on the seventh day. He will be back at work in two weeks.

Question from the floor: How did you close the gap in the dura?

Dr. Williamson: We laid a piece of gelfilm over it.

Dr. Calkins: I think we should all remember that papilledema caused by increased intracranial pressure may very well not disturb central vision at all. A man may have papilledema of four or five diopters and enlargement of his physiologic blind spot to twice its normal size and still have 20/20 vision. When one sees an edematous nerve head, the first step in determining the cause is to check the patient's visual acuity. If this is good, the papilledema is probably due to extrinsic pressure; if it is poor, the cause is probably local disease, for example optic neuritis. Even slight inflammatory disease of the optic nerve, either at the nerve head or in the retrobulbar position, will usually affect the patient's central vision. On the other hand, choked disc unaccompanied by impairment of central vision is a finding that calls for careful further investigation, the more, perhaps, if the neurologic examination is otherwise normal, as it was in this case.

Dr. Friesen: Dr. Williamson, are meningiomas always benign?

Dr. Williamson: Not always. Malignant meningiomas are uncommon, but they do exist and may result in meningiomatosis.

Dr. Friesen: If they become sarcomatous, do they metastasize?

Dr. Stowell: Perhaps "malignant" is a better term than "sarcomatous," since the origin of these tumors is still uncertain. Meningiomas, even the benign ones, tend to grow into the overlying bone; but even malignant meningiomas rarely if ever give rise to metastases either within the cranium and spinal canal or outside. One case of metastasizing meningioma has been described by Cushing and Eisenhardt.¹ In the present case histologic examination of the tumor revealed a benign meningioma, and we can feel confident of a complete cure.

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Classification, Regional Behavior, Life History and Surgical End Results. Springfield, Charles C Thomas, 1938.

PHYSICIANS' ACTIVITIES

Dr. George L. Thorpe, Wichita, has been named chairman of the American Medical Association Section on General Practice. He will preside at the general practice scientific assembly at the A.M.A. meeting in New York, June 3-7, 1957.

The town of Attica, which completed construction of a hospital building five months ago, announced recently that a physician had been secured for the community. **Dr. Warren J. Scherlingkamp**, a graduate of Louisiana State University School of Medicine, who had been practicing in New Orleans for seven years, opened an office in Attica last month.

Dr. Martin L. Brakebill, Sharon Springs, has resigned as physician for the Union Pacific Railroad. He will continue in private practice with an office in his home.

Dr. Bill Justus, who recently began practice in Pleasanton, has been made health officer of Linn County. **Dr. William K. Walker** is serving in the same capacity in Chautauqua County.

The Gelvin-Haughey Clinic, Concordia, announces that **Dr. Paul L. Nelson** is now a member of its staff. Dr. Nelson, a graduate of the University of Kansas School of Medicine, recently completed internship in Denver.

Dr. Herbert C. Miller, chairman of the Department of Pediatrics at the University of Kansas Medical Center, is among the founding members of the newly-organized National Council on Infant and Child Care. The council was formed to assist writers and editors in presenting developments in pediatric medicine to the public.

A feature story in the *Concordia Blade-Empire* recently paid tribute to **Dr. Guy E. Martin**, who has begun his 51st year of practice.

Dr. Perry D. Petterson, Wichita, recently be-

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came a diplomate of the American Board of Internal Medicine.

After having practiced more than 50 years in Bennington, **Dr. Llewellyn M. Hinshaw** has retired. He was honored by the community in 1952 for his long service.

Dr. Henry Laurens, Jr., formerly of Salina, joined the staff of the Scott and White Clinic, Temple, Texas, on October 1 and is specializing in gastroenterology and proctology there.

Feature stories about **Dr. C. B. Harris, Sr.**, Garnett, who has completed 50 years of practice, were carried last month in the *Kansas City Times*, the *Topeka Daily Capital*, and newspapers in the locality of Garnett. At a dinner in his honor given by the Anderson County Medical Society, Dr. Harris was given a 50-year pin. The presentation was made by his son, **Dr. C. B. Harris, Jr.**

Dr. Alfred M. Tocker and **Dr. W. G. Cauble**, Wichita, collaborated to write a paper, "Urinary Incontinence in Leric Syndrome: Treatment by Excision of Occluded Abdominal Aorta and Common Iliac Arteries and Replacement with Homograft," published in a recent issue of *Journal of Urology*.

"Severe Radiation Accident" was the title of an exhibit presented at the September meeting of the Kansas City Southwest Clinical Society by the following physicians from Kansas City: **Dr. Peter E. Hiebert**, **Dr. Lewis G. Allen**, **Dr. William R. Allen**, and **Dr. Doris A. Kubin**.

Dr. Marshall P. Ballard, Delphos, was the subject of a feature story in a recent issue of the *Delphos Republican*.

Dr. E. N. Robertson, Concordia, recently completed 50 years in the practice of medicine and, with **Dr. Guy E. Martin** of Concordia, was honor guest at a dinner given by the staff of St. Joseph's Hospital, Concordia. Each physician was given a citation expressing appreciation for 50 years of service.

An office has been opened in Garden City by **Dr. Richard E. Hille**, who will have a general prac-

tice. He was graduated from the University of Kansas School of Medicine in 1955 and recently completed his internship at the University of Kansas Medical Center.

Dr. Chester M. Lessenden, Jr., Topeka, was one of the speakers at a meeting of the Kansas State Pediatric Society at Emporia last month. He discussed adolescent acne and tinea capitis.

Fifty years in the practice of medicine have been completed by **Dr. Walter A. Carr**, Junction City. A story about Dr. Carr was printed in the September 6 issue of the *Junction City Union*.

Dr. George L. Basham, who formerly practiced in Wichita, has opened an office in Oaklawn.

Dr. William J. Reals announces that **Dr. Peter J. Wick** is now associated with him in the practice of pathology at Wichita-St. Joseph Hospital, Wichita.

Dr. D. V. Conwell, Wichita, attended the first Pan-American Congress of Gerontology in Mexico City, September 15 to 22, and presented a paper, "The Influence of Insulin on the Renal Function of Geriatrics Patients." The Pan-American Congress is sponsored by the International Association of Gerontology and affiliated societies of the American continent.

COUNTY SOCIETIES

Dr. Robert Weber, of the Department of Medicine at the University of Kansas Medical Center, was guest speaker at the September meeting of the Shawnee County Medical Society. He discussed "Current Problems in Antibiotic Therapy." At the business session the group approved use by the Kansas State Board of Health at the Kansas Free Fair in Topeka of a device for testing blood sugar.

"The Past, Present, and Future of Blue Shield" was the subject discussed by the Wyandotte County Medical Society at a meeting held in Kansas City on September 18. **Dr. Frank L. Feierabend**, Kansas City, president of Kansas City (Missouri) Blue Shield, and **Dr. Francis T. Collins**, Topeka, president of Kansas Blue Shield, were speakers.

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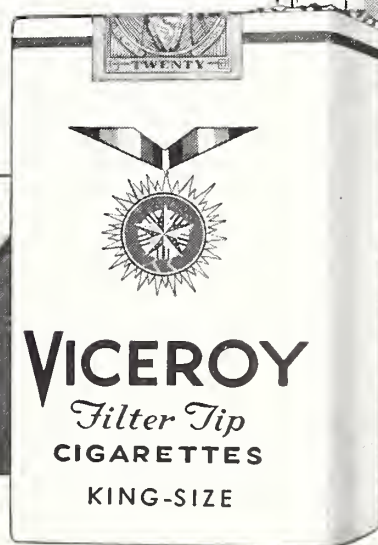
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Gastric Studies

Advantages and Limitations of Uropepsinogen Excretion Tests in Diagnosis

ROSS L. JEWELL, M.D., *Wichita*

The desirability of having a method for measuring gastric peptic activity under life stress situations in health and disease without requiring the passage of a stomach tube has stimulated much work during the past decade on a quantitative determination of the proteolytic enzyme, uropepsinogen, in timed urine specimens. This procedure is not only free of the physical and emotional discomforts of gastric suction, but is, in some conditions of psychogenic or organic illness, one of the few methods for obtaining important information.

Brücke,⁹ in 1861, discovered uropepsinogen when he incubated urine with a highly acid fibrin substrate and noted digestion of the fibrin. This observation was confirmed by Grutzner³¹ in 1882. Bucher,¹¹ in her excellent review of the development of the enzyme chemistry of uropepsinogen, states that many reports about the enzyme appeared in the German literature soon after Grutzner reported his observation. Little of the early data is fully acceptable today because of the dearth of knowledge concerning enzyme reactions and the inability of the methods available at that time to give reproducible results. This enzyme was thought to be pepsin until Glaessner,²¹ in 1902, discovered that it was pepsinogen and demonstrated its conversion into pepsin. Northrop^{48, 49} crystallized pepsin from swine and bovine stomachs and found this protein to act as a unit in proteolysis.

Variations of the original fibrin digestion technique for determining uropepsinogen excretion were used until 1910. A number of techniques then appeared.^{11, 49} However, no significant advancements were made until Gottlieb,²⁴ in 1924, devised an accurate method for the simultaneous study of pepsin in the stomach, blood, and urine. He was the first worker to employ careful measurements of the pH and specific gravity of urine, to use a 24-hour urine output, and to consider the influence of diet in controlling his experiments.

In 1927 Folin and Ciocalteu¹⁸ devised a colorimetric method for estimating tyrosine in protein hydrolysate with the use of a phenol reagent. Anson and

Mirsky,¹ in 1932, devised an accurately reproducible technique for estimating peptic activity by an enzymatic splitting of carboxyhemoglobin substrate as determined by the release of a tyrosine-like substance. The test they outlined is essentially the test most widely used today. However, it has received certain modifications, e.g., Anson² standardized the pH at 1.6 to give the optimum enzyme reaction, and Bucher et al.¹⁰ found that an accurate measurement of the enzyme activity in a concentrated sample could be accomplished only by dilution of the sample. Duffin and Kowlewski¹⁵ stated that dialyzed urine samples should be used to obtain accurate uropepsinogen estimations. Bridgewater,⁷ however, demonstrated that dialysis is unnecessary for the assay. By 1950 the unit of activity was defined⁵⁰ as a release of 0.04 mgm. of tyrosine-like substance during 30 minutes incubation at 37° centigrade.

A number of workers consider 24-hour samples necessary for accurate uropepsinogen excretion estimations.^{11, 28, 57} Other workers claim similar results from specimens of shorter duration.^{4, 60} Wolfson and Timms,⁶³ in 1954, reported that the diurnal variation of creatinine excretion matched that of uropepsinogen. On the basis that a minimum day to day variation of creatinine had previously been demonstrated by Smith,⁵⁵ they concluded that the determination of uropepsinogen:creatinine on casual urine specimens gives information similar to that from 24-hour samples.

A simple, rapid laboratory technique using the coagulation of milk as an end point and requiring no blank or colorimetric determinations was described by West et al.⁶⁰ in 1952. Although this procedure has been criticized by advocates of the hemoglobin technique, Balfour⁴ stated that the test gives comparable results to those obtained by proteolytic activity and is adequate for hospital and laboratory purposes.

ORIGIN AND ROUTE OF UROPEPSINOGEN

Bucher¹¹ stated that the early workers postulated that pepsin was manufactured in some extragastric region and adsorbed on fibrin during its formation, or that pepsin was carried from the stomach to the kidneys by leukocytes. The stomach was demonstrated to be the source of uropepsinogen by Frouin¹⁹ in 1904. He reported that uropepsinogen excretion had rapidly

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Jewell is now serving his internship at Wesley Hospital, Wichita.

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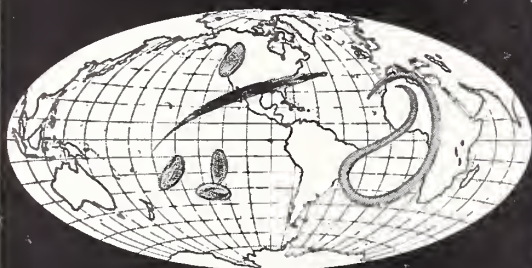
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disappeared from a totally gastrectomized dog and did not reappear when the dog was fed gastric juice from normal dogs. He also reported that a normal level of uropepsinogen excretion remained in a dog with an externalized gastric pouch in which the blood supply was kept intact. From these experiments he concluded that uropepsinogen enters the blood stream as an endocrine secretion of the peptic cells of the stomach and that no resorption occurs from the intestine. This verified the findings of Langly.⁴⁴

Langly, in 1881, was the first to demonstrate that pepsinogen was secreted from the gastric mucosa and was rapidly converted to pepsin in the stomach. He also described the rapid breakdown of pepsin in the small intestine. Gottlieb,²⁴ using his improved techniques, found pepsinogen in the blood and demonstrated that its level correlated closely with gastric pepsin. Mirsky et al.,⁴⁶ in 1948, reported that the feeding of pepsin or pepsinogen, or the intravenous injection of pepsin, did not increase uropepsinogen excretion, but the intravenous injection of pepsinogen did raise the level. Herriott^{34, 35} added confirmation to the evidence of a proenzyme transfer by the blood when he described the autocatalytic conversion of urinary pepsinogen to pepsin as starting at pH 5. The pepsinogen, Hirschowitz³⁶ stated, is carried by the blood to the kidneys where, due to its comparatively low molecular weight, it is filtered through the glomerular membrane and partially reabsorbed by the tubules.

Convincing evidence of a uropepsinogen excretion:gastric pepsin ratio of approximately 1:99 was submitted by Janowitz and Hollander.^{38, 39, 40} They found no evidence that pathological changes, short of complete atrophy of the gastric mucosa, would affect the ratio and they suggested that the failure of histamine to stimulate uropepsinogen excretion is probably explained by the inability of histamine to stimulate pepsin secretion in the stomach. Similar findings have been reported by Bucher¹¹ and Spiro et al.⁵⁷ Gray et al.²⁸ however, found this correlation of gastric pepsin:uropepsinogen excretion to range from 98.0-99.5:2.0-0.5. The ratio, they stated, remained constant for each individual, and the uropepsinogen excretion was directly proportional to the amount of pepsin producing material in the stomach.²⁹

RELATION TO GASTRIC ACIDITY AND TO ANTICOLINERGICS

Uropepsinogen excretion levels have been reported to be comparable to levels of gastric acid and pepsin secretion under conditions of basal secretion in normal individuals⁵ as well as in persons under stress situations induced by ACTH therapy,²⁷ gastric and duodenal ulcers, and gastric carcinoma.³⁸ Podore et al.,⁵² however, could find no causal relationship, and they considered the correlation to be only fortuitous. Podore's findings have been verified by many workers

who observed a loss of correlation between gastric acid and uropepsinogen excretion in a number of peptic ulcer patients,³⁰ in individuals treated with insulin,²⁹ in persons receiving caffeine or histamine,^{12, 22} and occasionally in hyperchlorhydric patients.³ Although Gray et al.²⁸ and Balfour⁴ found no change in uropepsinogen excretion in response to anticholinergic therapy, Whitrock et al.,⁶¹ Silver et al.,⁵³ and Cumberly et al.¹³ noted a decrease in uropepsinogen excretion levels following methantheline and propantheline medication.

RELATION TO URINARY EXCRETION

Podore et al.⁵¹ and Spiro et al.⁵⁷ found that the rate of excretion, volume, specific gravity, or pH of normal urine had no influence on the uropepsinogen excretion level. Balfour⁴ reported no retention of uropepsinogen in patients with marked kidney disease. He pointed out that with no destruction of uropepsinogen in the urine, with no known catabolism of it in the body, and with no overflow to the kidney, any decreased level of uropepsinogen excretion demonstrates little or no production by the stomach.

UROPEPSINOGEN EXCRETION IN THE NORMAL INDIVIDUAL

Various workers have demonstrated that the levels of uropepsinogen excretion are similar to the normal gastric acid levels reported by Van Zant et al.⁵⁹ in 1932. Podore et al.⁵¹ found children to have a lower excretion level than adults. Eastcott et al.¹⁶ noted men to have a somewhat higher level than do women. Balfour⁴ reported a lower level in older age groups. Hirschowitz,³⁶ however, could find no statistical difference between the younger and older adult groups.

Balfour⁴ observed uropepsinogen excretion to rise slightly above normal during menstruation and pregnancy and to drop below normal levels following parturition. Most workers report no significant difference in uropepsinogen excretion levels following ordinary variations in diet, but there have been differences in the findings reported from persons subjected to marked diet changes. Balfour⁴ found a lowered uropepsinogen excretion level to be associated with reduction programs and starvation. Bucher¹¹ and Bucher and Anderson¹² observed a marked increase of uropepsinogen excretion by doubling the protein intake for three days and a decrease caused by a similar period of low protein intake. Smith and Cowgill⁵⁴ and Goodman et al.²³ could find no variation in gastric pepsin or in uropepsinogen excretion from individuals changed from a regular diet to a high protein diet.

RESPONSE TO DISEASE

In 1955 Gray et al.³⁰ reported the mean value of uropepsinogen excretion to be 3670 units in normal people, 8471 units in patients with duodenal ulcer, 1815 units in patients with gastric carcinoma, and 13

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Bumbalo, T. S., Gustina, F. J.,
and Oleksiak, R. E.:
J. Pediat. 44:386, 1954.

White, R. H. R., and
Standen, O. D.:
Brit. M. J. 2:755, 1953.

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J. Pediat. 45:419, 1954.

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units in patients with pernicious anemia. Cubberly et al.¹³ found superficial gastritis and mixed gastritis to give no conclusive variations in uropepsinogen excretion whereas a normal appearance of the gastric mucosa was not necessarily associated with a normal level.

In three of four patients in whom lymphoma involved the stomach, Balfour⁴ observed an elevated uropepsinogen excretion. Spiro et al.⁵⁸ reported a surprisingly high percentage of increased blood pepsinogen levels and elevated gastric acid values in gastric ulcer patients, and he suggested that the usual clinical findings of decreased acidity may result from mucous buffers of the nonparietal secretion.

Podore et al.^{51, 52} reported a definite rise of uropepsinogen excretion in the majority of duodenal ulcer patients and a much greater than normal fluctuation from the mean level; however, there was a fairly characteristic rate of uropepsinogen excretion for each ulcer patient. They stated that the gastric pepsin and uropepsinogen excretion of normal persons and those of duodenal ulcer patients have too much overlapping to have much diagnostic value when used alone but may be of value as an adjunct in the diagnosis of peptic ulcers.

Gray et al.²⁹ demonstrated that gastric pepsin is not significantly reduced in peptic ulcer patients following vagotomy. He pointed out that the mean average uropepsinogen excretion levels before and after vagotomy were 4923:4196 units, whereas the mean average value before and after subtotal resection was 7010:2792 units.

Hirschowitz³⁶ used a more complete separation of patient groups than was used by the other workers. He found that women, with or without ulcers, had normal amounts of uropepsinogen excretion, that men with duodenal ulcers of less than five years duration had normal levels, but uropepsinogen excretion was elevated in men with duodenal ulcers of more than five years duration.

Most workers have reported lower than normal levels in patients with gastric carcinoma. Gray et al.²⁹ observed a lower than normal mean average uropepsinogen excretion value; however, they found that 14 per cent of the levels in these patients were between 4,000 and 30,000 units, the normal being 3670 units. Within a small group of gastric carcinoma patients, Balfour⁴ noted an increased postoperative survival rate in individuals who had demonstrated substantial preoperative uropepsinogen excretion levels as compared to those with low preoperative levels. He theorized that the low values were possibly caused by an inadequate protein intake as well as by the destructive efforts of carcinoma on the gastric mucosa.

All workers report lower than normal levels in achlorhydric patients, and elevated levels in the majority of patients with hypertrophic gastritis.

Helmer et al.,³³ in 1932, found the peptic activity of gastric juice from patients with pernicious anemia to be about one per cent of the normal level. All workers have found blood pepsinogen and uropepsinogen excretion levels in these patients to be correspondingly low or absent in the presence or absence of stress situations.

Uropepsinogen excretion has little correlation with extragastric diseases such as gout⁵⁷ or ulcerative colitis.^{6, 23, 43} Gray et al.²⁹ postulated that the lowered level in myxedema is secondary to the decreased adrenal function.

RELATION TO STRESS

Asher³ stated that the most important factor in uropepsinogen excretion at any given time is the stress situation of the patient. The stress factor may have much bearing on the diurnal variation and variation from hour to hour of the levels of individuals. Asher,³ Balfour,⁴ Eastcott et al.,¹⁶ Levine et al.,⁴⁵ and Spiro et al.⁵⁸ report variations of level during the day. Podore et al.⁵² and Goodman et al.²³ reported minor to marked diurnal variation in 24-hour and overnight samples respectively. Broh-Kahn et al.,⁸ however, found a fairly constant logarithmic value of uropepsinogen excretion levels throughout the day and from day to day in healthy men.

Gray et al.²⁸ observed a low uropepsinogen excretion level in Addison's disease and a high level associated with hyperactivity of the adrenal, pituitary, or hypothalamus in the presence or absence of the vagus nerve. They deduced from their findings that emotional and systemic stress may follow a pathway to the stomach other than the hypothalamus vagus route demonstrated by Cushing¹⁴ and Keller.^{41, 42} They theorized that "stress may cause the hypothalamus to secrete a hormonal substance which stimulates the pituitary to secrete ACTH. This activates the adrenal cortex to release a number of steroid hormones which cause the gastric glands to secrete acid and pepsinogen." They observed that acute physical stress caused a higher elevation of uropepsinogen excretion than was caused by chronic physical stress, the mean maximums being 22,000:10,000 units respectively.

A rise of uropepsinogen excretion to high levels has been observed by Balfour⁴ in patients undergoing acute emotional stress. Jacobs et al.³⁷ found levels to decrease when psychotic patients lost contact with reality but to rise gradually when the patients recovered from insulin shock. Jacobs et al. considered that a release of adrenalin and its effect on the pituitary-adrenal axis was partially responsible for the uropepsinogen excretion elevation.

During recent years there have been many reports concerning the stress effects of corticosteroids on uropepsinogen excretion levels. Gray et al.²⁸ pointed out that the glycocorticoid type hormones, ACTH, corti-

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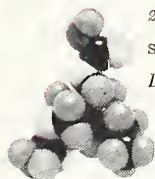
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sone, compound B, and compound F are effective in uropepsinogen excretion elevation. Wolfson and Timms,⁶⁴ however, noted that corticosterone, which has both glyocorticoid and mineralocorticoid activity, was ineffective in elevating the level. They concluded from this observation that the elevation cannot be closely related to glyocorticoid action. Gray et al.,²⁹ Spiro et al.,⁵⁷ and others⁵⁰ stated that continued ACTH administration stimulates physiologic reactions of stress in that it elicits many of the same responses as those of sustained alarm.

Gray et al.²⁷ observed that single large doses of ACTH or cortisone given to normal persons did not elevate the gastric acid or pepsin, but a single dose did cause marked increase in volume and acidity of gastric juice when given to a person with an inactive duodenal ulcer. A response similar to that found in the inactive duodenal ulcer patient appeared in normal persons in one to two days of repeated administrations of excess amounts of ACTH or cortisone.²⁵ The maximum effect of these doses in normal persons occurred in 7 to 14 days of continuous treatment.²⁷ This period of 7 to 14 days coincides with the usual time which precedes reactivation, perforation, or hemorrhagic manifestations of peptic ulcers during continuous ACTH or cortisone therapy.^{26, 32, 56}

Active duodenal ulcer patients do not display the immediate rise of uropepsinogen excretion seen in the normal person when ACTH is started. Gray et al.²⁵ described a delayed elevation of about five days in duodenal ulcer patients, and he postulated that this delay may denote the effect of a chronic alarm reaction on the adrenal cortex. Woldman⁶² found a striking correlation between the severity of adrenal damage and the incidence of mucosal hemorrhage and ulceration of the upper gastrointestinal tract. Gray et al.²⁵ pointed out that the elevation of uropepsinogen excretion and blood pepsinogen was the result of peptic cell stimulation and not of renal threshold elevation. Their reasons for this hypothesis are the gradual increase for four days of the already high uropepsinogen excretion of duodenal ulcers following administration of ACTH for five days and the increase in gastric pepsin after ACTH stimulation.

Garst and Hillyard²⁰ observed that the adrenal pathway is more prominent in young than in older persons. These workers measured uropepsinogen excretion and 17-ketosteroids before, during, and after stressful situations and observed a marked correlation in young persons and a negative correlation in older men. They postulated, from these observations, that pathways other than the hypothalamic-pituitary-adrenal route predominate in older persons.

CONCLUSIONS

A number of limitations for the clinical use of uropepsinogen excretion approximation have been

pointed out; however, the test has also been shown to have advantages.

This approximation cannot be used alone to differentiate between the normal person and the duodenal ulcer patient,^{6, 23, 36} and it should not be used as an index of adrenocortico activity unless the morphologic state of the gastric mucosa is known.¹³ This test is not suitable as a screening procedure for gastric carcinoma, because only 55 per cent of gastric carcinoma patients have less than 1000 units of uropepsinogen excretion.³⁰

The advocates of this examination, however, suggest that it is useful within limits *as an adjunct* in the differential diagnosis of duodenal ulcer from other sources of hematemesis,^{3, 16, 29} from gastric ulcer,^{6, 16, 47, 52} from gastric carcinoma,^{16, 29} and from other causes of dyspepsia.¹⁶ The measurement of uropepsinogen excretion is particularly valuable in the determination of gastric peptic activity under life stress situations.^{4, 6, 16, 29, 36, 45, 53} It has about the same value as measuring gastric analysis in estimating the total constant functioning activity of the stomach,⁴ and normal or elevated uropepsinogen excretion appears to be of considerably more value than levels of gastric acid in the diagnosis of benign gastric lesions.³⁰ In certain conditions such as upper gastrointestinal hemorrhages, uropepsinogen excretion can be determined when it would be impossible to measure gastric acidity.⁴

Gastric ulcer, ulcerating carcinoma, adrenal and pituitary hypersensitivity, ACTH and cortisone therapy, and stress all possess higher than normal mean uropepsinogen excretion values, whereas gastric carcinoma, pernicious anemia, Addison's disease, myxedema, and total gastrectomy all have lower than normal mean levels.²⁹

The proteolytic test is difficult to perform and requires accurate periods of collection.⁶ The milk coagulation test, however, is comparatively rapid and simple to perform,⁴ and it is easier to obtain urine than gastric juice and requires less of the patient's time.^{4, 53}

Other criticisms of the test point toward the short term fluctuations of the uropepsinogen excretion level which require multiple observations during any test period, and toward the occasional slowly developing shifts of base line which may obscure changes resulting from experimental procedure unless multiple control periods are used.^{8, 28, 53}

A uropepsinogen excretion examination at regular intervals is especially valuable in measuring gastric pepsin secretion after subtotal gastric resection,⁴ and it is an aid in the diagnosis of total gastric resection,^{23, 29} or pernicious anemia.^{17, 23, 29}

Elevated or low values in "normal" persons may be the indication of a precursor condition to duodenal ulcer or pernicious anemia respectively.⁴⁷ It is possibly

"My back
was so tight
I couldn't
even get on
and off
the bus;
now I can
climb stairs."

"Take it
from me,
you should
be glad
you saw him
early in the
game so he
could do
some good."

"Good?—
why, he's
got me doing
exercises
I haven't done
in years."

"I hope
he helps
my knee
that quick."



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of some value in determining the state of nutrition.^{4, 11}

The examination of uropepsinogen excretion offers an opportunity to study certain drugs over periods of weeks rather than hours.⁵³ The determination is of much value during cortisone or ACTH therapy for the measurement of gastric response,^{28, 29} or as a guide to the management of an ulcer program.⁴ Some changes in functional states as related to stress and in Cushing's ulcer are comparatively apparent by the uropepsinogen excretion test. The test is also of value in judging the proper dosage of cortisone for the treatment of lymphoma.⁴ It may possibly serve as a measure of studying adrenocortical situations.^{16, 29, 37, 57} There is evidence that uropepsinogen excretion determination is of value in differentiating the effects of direct psychic stress from the effects of secondary stress involving adrenocortical oversecretion.⁴

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Results of Tuberculosis Study

Recommendations of the out-of-state team of specialists who have made a study of tuberculosis in Kansas were presented by Dr. Joseph B. Stocklen, Cleveland, study chairman, at the annual meeting of the Kansas Tuberculosis and Health Association in Wichita, September 27.

"The Kansas Medical Society has followed the work of the study team with interest," said Dr. Monti L. Belot, Lawrence, president of the Kansas Trudeau Society. "Members of the Committee on Control of Tuberculosis, under the chairmanship of Dr. J. W. Spearing, as well as many individual physicians, have participated actively in the project."

Notable progress in tuberculosis control in Kansas was recognized, but Dr. Stocklen reminded doctors and health and social workers that there is much to be done if control of tuberculosis is to become a reality in the foreseeable future. The need for unified direction of public health and hospitalization aspects of the disease was stressed as essential.

Dr. Stocklen mentioned the function of private physicians in casefinding and in the treatment of tuberculosis patients. These are particularly important, he said, because of the total lack of diagnostic and treatment facilities for non-hospitalized patients in many counties and extremely limited facilities in others.

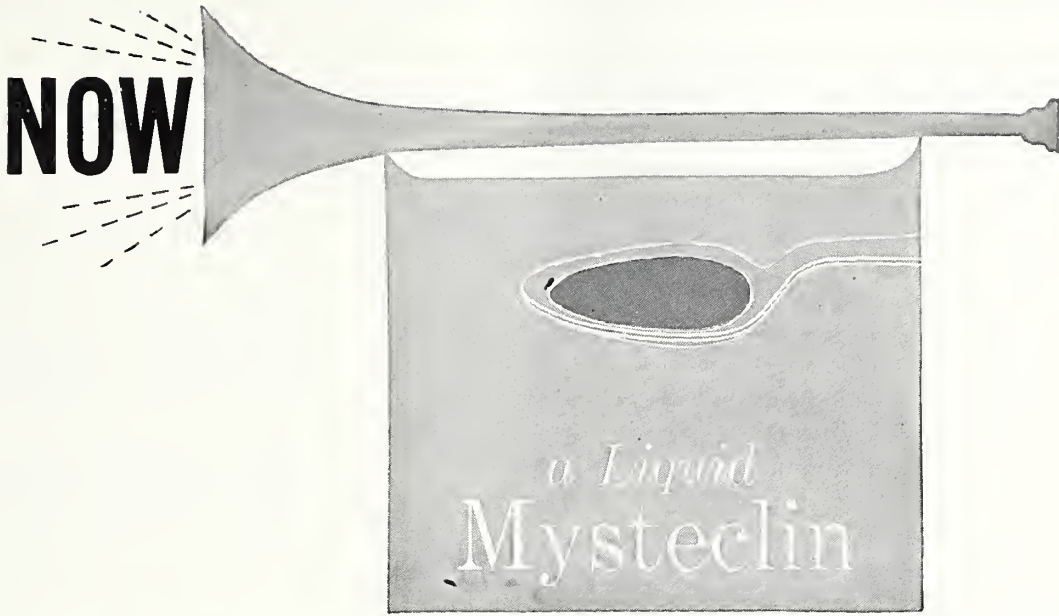
The report noted that with new treatment methods, the private physician will be called upon more and more frequently to care for patients with tuberculosis. This points up the need for continued professional familiarity with present concepts of treatment and its public health implications.

The high prevalence of tuberculosis in low income groups and the lack of public tuberculosis clinics in Kansas were revealed by the study. After consultation with the Kansas Medical Society's Committee on Control of Tuberculosis, the study team recommended that a system of medically approved clinics be established for casefinding, diagnosis, and treatment of tuberculosis.

The study report suggested the Kansas Medical Society and the Kansas State Board of Health continue collaboration in the development of a plan for the proper care and treatment of the recalcitrant tuberculous patient.

To coordinate the efforts of various agencies, the study group recommended that a tuberculosis control officer with experience in clinical and public health aspects of tuberculosis be placed in charge of the entire tuberculosis program in Kansas.

The group also recommended more frequent x-ray surveys for those in southeast Kansas and in metropolitan areas where there is the highest incidence of the disease. It was noted that the cause of control



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could be advanced by educating the public to better participation in x-ray programs.

Copies of the complete report, containing these and other recommendations, are available in limited number. Those wishing to have copies may secure them through the Kansas Medical Society, 315 West Fourth Street, Topeka, or through the Kansas Tuberculosis and Health Association, 1134 Topeka Avenue, Topeka.

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

Regardless of which party organizes the next Congress or who occupies the White House, health and welfare legislation promises to take up considerable time and attention of lawmakers. There is nothing to indicate that the general subject of health has lost its appeal either to the public in general or to men who run for political office in particular.

The national platforms on which the candidates of both parties have been campaigning are somewhat of a blueprint for the type of legislation to come in the 85th Congress, convening next January 3; generally, both parties advocate more rather than less federal participation in health and welfare programs. Here are some of the points in the two platforms:

Aid to Medical Schools—The Republicans recommend "federal assistance to help built facilities to train more physicians and scientists" as a supplement to action of the 84th Congress authorizing federal grants to schools and other groups for laboratory research facilities. The Democrats state: "We pledge ourselves to initiate programs of federal financial aid, without federal controls, for medical education."

Aid to Hospital Construction—The Republican plank: "Republican leadership has enlarged federal assistance for construction of hospitals." The Democratic plank: "We pledge continuing and increased support for hospital construction programs."

Medical Research—Republicans: "We have asked the largest increase in research funds ever sought in one year to intensify attacks on cancer, mental illness, heart diseases, and other dread diseases." Democrats: "We shall continue to support vigorously all efforts, both public and private, to wage relentless war on diseases. . . . We commend the Democratic party for its leadership in obtaining greater Congressional authorizations in this field."

Vocational Rehabilitation—Republicans: "We

have fully resolved to continue our steady gains in man's unending struggle against disease and disability." Democrats: "We pledge support to a vastly expanded rehabilitation program for these physically handicapped, including increased aid to states."

Medical Care—Republicans: "We have encouraged a notable expansion and improvement of voluntary health insurance, and urge that reinsurance and pooling arrangements be authorized to speed this progress." Democrats: "We pledge . . . increased federal aid to public health services, particularly in rural areas."

Social Security—Republicans: "We shall continue to seek extension and perfection of a sound social security system." Democrats: "By lowering the retirement age for women and for disabled persons, the Democratic 84th Congress pioneered two great advances in social security. . . . We shall continue our efforts to broaden and strengthen this program by increasing benefits to keep pace with improving standards of living, by raising the wage base upon which benefits depend, and by increasing benefits for each year of covered employment."

NOTES

Further evidence that federal aid to medical schools will be high on the agenda of the next Congress is the survey under way by the staff of the House Interstate and Foreign Commerce Committee. More than 50 organizations have been sent letters requesting background facts on financial needs of medical schools and the demand for medical school applicants "rather than arguments intended to support or oppose any particular form of federal aid." The information is being gathered as a preliminary to hearings in the next Congress.

Public Health Service announced the availability of 250 traineeship grants for graduate or specialized training of professional public health personnel under the newly enacted Health Amendments (Omnibus) Act. Emphasis is on bringing new and younger people into public health, men and women under 35 years of age. Congress voted \$1 million for this program this year. Another 500 traineeships from a \$2 million appropriation are offered for graduate nurses in administrative, supervisory, and teaching positions.

While Defense Department officials were putting the finishing touches on regulations to carry out the military dependents medical care program, the State Department was working on its own version of a program for furnishing care to about 13,500 dependents of Foreign Service personnel stationed overseas. In most instances, medical and hospital care (with a \$35 deductible clause) will be supplied in U. S. military installations.

...part of every illness

ANXIETY

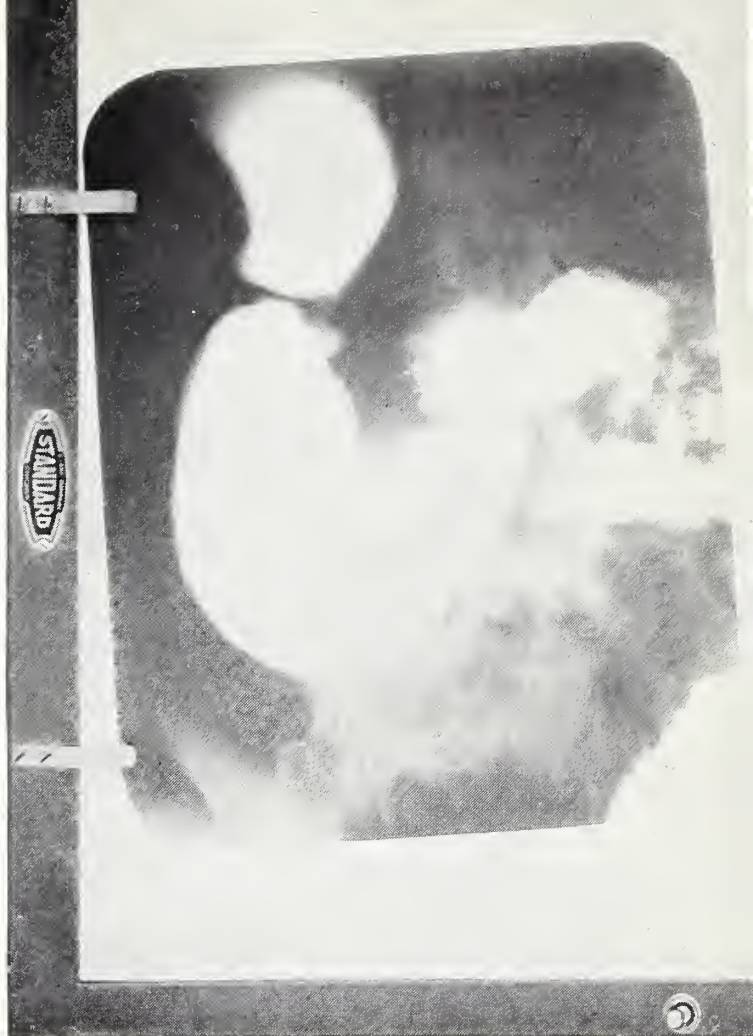
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1. Weiss, E., and English, O.S.: Psychosomatic Medicine, W. B. Saunders Co., Philadelphia, 1949, p. 358.
2. Lemere, F.: Northwest Med. 54:1098 (Oct.) 1955.

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BOOK REVIEWS

The Recovery Room—Immediate Postoperative Management. By Max S. Sadove, M.D., and James H. Cross, M.D. Published by W. B. Saunders Company, Philadelphia. 597 pages. Price \$12.

This book opens up an entirely new concept of management of critically ill patients. Though it is stated on the cover that it is written about immediate postoperative management, it proceeds in its first chapter to discuss and describe what is termed an "Intensive Therapy Unit." This unit is designed to care for patients emerging from anesthesia and those who are critically ill—comatose, cardiac, neurosurgical, and accident cases.

The book is an exhaustive and detailed collection of ideas on management of critically ill patients of every category. It is well written and informative. If there could be any criticism, it might be that the authors left nursing care in the recovery room to the last and gave it comparatively little space. It has been our observation that the quality of nursing care in the recovery unit is one of the most important factors in its success.

This book should be considered a "must" in the recovery room library and should be referred to by doctors and nurses alike in operating existing units and in planning and expanding new facilities.—*W.O.M.*

Diseases of the Chest. By Corwin Hinsbaw, M.D., and L. Henry Garland, M.D. Published by W. B. Saunders Company, Philadelphia. 727 pages. 634 illustrations. Price \$15.

The authors have presented a well organized survey of the diseases of the chest exclusive of heart disease. They have most successfully made this a contemporary book with an inclusion of the latest developments in the field evaluated in the light of their extensive experience.

The initial section of the book involving diagnostic procedures may occasionally seemingly refute some of our classic conceptions; for example, the authors advised that the physician have the x-ray image in mind *prior* to the physical examination of the chest. As one reads on, however, there remains no doubt about the thoroughness of the authors' technics of physical diagnosis.

The apparent bulk of the volume is diluted by extremely frequent and well chosen x-ray pictures. The print is easily read. The outlines preceding each chapter and the summaries following are quite helpful.

I feel this book is a useful reference volume, and its main worth will be in the readiness with which current views in the field of chest disease may be found in an office or hospital library.—*J.L.M.*

A Modern Pilgrim's Progress for Diabetics. By Garfield G. Duncan, M.D. Published by W. B. Saunders Company, Philadelphia. 222 pages. Price \$2.50.

This compact book is small enough to fit conveniently in a suit coat pocket. It is composed of two parts. The first part (144 pages) is about the experiences of a young diabetic social worker who is employed in a diabetic clinic. The remainder of the 222-page book is devoted primarily to an appendix with a short glossary and index.

Problems faced by all young diabetics are covered in an interesting fashion in the social worker's own life. In the clinic she meets all the typical types of diabetic patients. These are all treated as personalities and are given names so that their characteristics may be better remembered and understood by a new or old diabetic who reads the book. During the course of the story, explanations are made regarding blood sugar, heredity, insulin, and other subjects. Footnotes indicate where to find more details on a given problem in the appendix. Cases of insulin reactions, diabetic acidosis, gangrene, neuritis, intermittent claudication, and other complications are illustrated. Finally the patient marries and has a baby, giving an opportunity to cover the problem of diabetes and pregnancy.

The appendix gives detailed descriptions of what diabetics should know about diabetes. The various insulins and their administration and the care of insulin reactions are discussed. Testing of urine for sugar and ketones and diabetic coma receive detailed attention. Diets are explained, and the exchange system is thoroughly covered. In the glossary, definitions of such terms as calorie, fat atrophy, and Sucaryl are given.

In the index one can find quick reference to where a subject is covered both in the story and in the appendix.

This book deserves a thorough clinical trial both as a ready reference book for the physician and as a book of instruction for the diabetic patient.—*T.J.L.*

The Neuroses in Clinical Practice. By Henry P. Laughlin, M.D. Published by W. B. Saunders Company, Philadelphia. 802 pages. Price \$12.50.

This volume sets forth the neurotic reactions in a readable, lucid, well-constructed arrangement. The author's modest hopes expressed in the preface are

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1. Cronheim, G., and Toekes, I. M.: Comparison of Sedative Properties of Single Alkaloids of Rauwolfia and Their Mixtures, Meet. Am. Soc. Pharmacol. & Exper. Therap., Iowa City, Iowa, Sept. 5, 1955.

2. Moyer, J. H.; Dennis, E., and Ford, R.: Drug Therapy (Rauwolfia) of Hypertension. II. A Comparative Study of Different Extracts of Rauwolfia When Each Is Used Alone (Orally) for Therapy of Ambulatory Patients with Hypertension, A.M.A. Arch. Int. Med. 96:530 (Oct.) 1955.

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exceeded because he has successfully combined several essential elements: extensive and interesting discussions of the subject matter, sufficient historical references to orient his presentation, and ample bibliography to indicate the amount of background effort entering into such a work.

We learned medicine in the concise, comfortable etiology-diagnosis-therapy-prognosis pattern and have always had trouble fitting the psychiatric entities into the same nice pattern. We were heartened, therefore, to find that the author has given us a practical, usable reference with due allowance for the infinite variety of mental reactions.

He performs one service if no other: the inclusion of a glossary of psychiatric terms. We have always had a suspicion that we "somatically-oriented" characters were not so far removed from our psychiatric brethren if we only knew what all those words really meant.—D.E.G.

The Doctor's Marital Guide for Patients. By Bernard R. Greenblat, M.D. Published by the Budlong Press, Chicago. 88 pages. Sample copies free to physicians. Patient price \$1.50.

This is a condensed presentation on the alleged facts of life and seems to us to be well written and as adequate for the orientation of young couples as the more involved books. After all, there is a limit to how much one can learn out of books. There is also a limit to the information a physician can get over to a nervous young couple in a reasonable period of time, and a manual of this sort for later perusal makes an excellent adjunct to his remarks. There is also a Catholic edition with obvious differences in reference to the matter of contraception. Perhaps the best recommendation is that both of the reviewer's copies were lent to prospective brides and have never been returned.—D.E.G.

Sleep. By Marie Carmichael Stopes, D.Sc., Ph.D. Published by the Philosophical Library, Inc., New York. 154 pages. Price \$3.00.

This reviewer first felt sympathy for the author, an English woman so sensitive that she once recognized a variation of four degrees from true north in the placement of her bed. Next came a feeling of irritation for one who can find so much about which to complain in our present civilization. Finally came a feeling of amusement and the thought that some of the cures proposed are less attractive than the complaint.

It seems incredible that the author can seriously mean the following statements: "The soft foam rubber mattress is an example of a modern 'advance' to

be avoided by all who value their health. It is pernicious . . . because rubber is an insulator, and cuts you off from electric currents of the earth with which you should be in contact." "It [leg cramp] was brought . . . by the stink given off by my new rubber hot-water bottle." "Till he is 15 or 16, no child should do brain work after that time [four o'clock in the afternoon]. "No child should be waked, not even a child of school age. Sleep is of far more value to a child than lessons." "If, on the other hand, as is so often and so foolishly the plan in modern homes, the sleeper has no chamber pot handy under or beside his bed . . . he will be very thoroughly awakened. I have seen no protest by any doctor, nor any public statement anywhere about the evil effects of this retrograde innovation in banishing the bedroom chamber, now so rampant among us masquerading as 'modern hygiene.'"

The author's pleasure in derogatory statements about this country is seen in the following: "About half the people in the United States of America suffer from sleeplessness. One is tempted to say, 'It serves them jolly well right.' They infringe the most fundamental laws of nature more than any other nation, and the ever-increasing tempo of their lives, combined with a mounting fear of future conditions, creates exactly the type of mind to defeat sleep's gentle ministrations."

It also creates the type of mind to predict that this book will enjoy little popularity in the United States. One is tempted to say of its author, "And it serves her jolly well right."—P.F.

Electrocardiography—Fundamentals and Clinical Application. Second Edition. By Louis Wolff, M.D. Published by W. B. Saunders Company, Philadelphia. 522 pages, 109 figures. Price \$11.50.

The first edition of this text was among the earliest to substitute a rational basis of electrocardiographic interpretation for the pattern memorization method. The second edition preserves the simplicity and understandability of the original introduction which included just enough electrophysics to permit a logical explanation of the various deflections of the normal and abnormal electrocardiogram.

The author has brought the text up to date by skillfully weaving in the concepts of vectorcardiography and ventricular gradients and pointing out the additional information they may yield. His presentation of vectorcardiography is purposely superficial on the basis that its applicability to clinical electrocardiography has not yet been clearly defined.

In addition to the chapters on right and left ventricular hypertrophy, right and left bundle branch block, myocardial infarction, and coronary artery



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disease included in the first edition, there have been added chapters on arrhythmias, pericarditis, pulmonary embolism, and abnormal electrolyte patterns.

The simplicity of language and the conciseness of this book make it an ideal introduction to electrocardiography for the novice, yet there are helpful facts which make it worth while reading for the more advanced student as well.—*R.T.C.*

Christopher's Textbook of Surgery. Sixth Edition. Edited by Loyal Davis, M.D. Published by W. B. Saunders Company, Philadelphia. 1484 pages, 1359 illustrations on 716 figures. Price \$15.50.

For 20 years *Christopher's Textbook of Surgery* has been a popular and standard single-volume text. The present volume is a worthy successor and is the first to appear under the editorship of Loyal Davis.

Recognizing the futility of attempting to put everything in one volume, "... Each contributor to this edition has had the aim to present his subject in such a way that he will stimulate the young and older students of surgery alike to read further, to think through the problems presented by each of their patients, and to ascertain by themselves the anatomic, physiologic, bacteriologic, pathologic, biochemic and pharmacologic factors involved. Surgery is the *art* of the application of the basic medical sciences and each individual engaged in its complexities of judgment, responsibility and decision must continue to educate and improve himself without thought of an end point."

"Each contributor has written in his own style of teaching and each one is authoritative in his field; each hopes that he will create in the reader a desire to learn more about the subject presented. Reading references have been provided to encourage the inquisitive and imaginative to seek further."

In keeping with the changing scope of surgical practice, some chapters, such as those on thoracic surgery and vascular surgery, have been expanded, but not to the exclusion of proper emphasis on common conditions such as hernia, gastrointestinal tract, biliary tract, and fractures. An introductory chapter on History of Surgery and a final one on Qualifications of a Surgeon round out a well balanced volume. The book deserves and will continue to be a most popular text for medical students and practicing surgeons.—*O.R.C.*

Great ideals and principles do not live from generation to generation just because they are right, nor even because they have been carefully legislated. Ideals and principles continue from generation to generation only when they are built into the hearts of the children as they grow up.—*George S. Benson.*

ANNOUNCEMENTS

Twenty-sixth annual clinical conference, Oklahoma City Clinical Society, Oklahoma City, October 22-25. Write 503 Medical Arts Building for program. Credit under category 1 by American Academy of General Practice.

Five short-term courses related to heart and circulatory system offered by New York University Postgraduate Medical School during November. Covered are cardiac roentgenology, electrocardiography, clinical electrocardiographic interpretation, peripheral vascular diseases, cardiac arrest and resuscitation. Write the Dean, 550 Forst Avenue, New York 16, New York.

December 1, deadline for submitting applications to National Foundation for Infantile Paralysis for postdoctoral fellowships. Fellowships available in rehabilitation, psychiatry, orthopedics, management of poliomyelitis, preventive medicine, research, and academic medicine. Stipends from \$3,600 to \$6,000. Write Division of Professional Education, National Foundation, 120 Broadway, New York City.

Course in practical electrocardiology presented by Dr. Demetria Sodi-Pallares, Mexico City, under auspices of University of Texas Postgraduate School of Medicine and Baylor University College of Medicine, Houston, December 3-7. Write Postgraduate School of Medicine, Texas Medical Center, Houston 25, Texas.

Award of \$500 for best article by a physician on any subject of medical economics, \$100 to \$300 for other articles accepted. Deadline December 31, 1956. Address Awards Editor, Medical Economics, Oradell, New Jersey.

Next scheduled examination (Part I), written, and review of case histories for candidates of American Board of Obstetrics and Gynecology, Inc., in various cities, February 1, 1957. Case reports due within 30 days of notification of eligibility to Part I. Deadline for requests for re-examination in Part II, February 1. Write the Secretary, Robert L. Faulkner, M.D., 2105 Adelbert Road, Cleveland 6, Ohio.

Eleventh annual symposium on fundamental cancer research, University of Texas M. D. Anderson Hospital and Tumor Institute, Houston, March 7-9, 1957. Subject, "Viruses and Tumor Growth."

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A.M.A. Clinical Session

The A.M.A. clinical session will be held in Seattle, November 27-30, with headquarters at the Olympic Hotel where House of Delegates and committee meetings will be held.

The scientific program at the Seattle Civic Auditorium will consist of 45 papers beamed at the general practitioner and covering such subjects as fluid balance, urological problems, office psychiatry, varicose veins, fractures, diabetes, and heart disease. Television clinics, both operative and non-operative, will treat of anesthesia, burns, bleeding problems, intestinal obstruction, caesarean section, hand surgery, and vein stripping.

The problem of darkness does not exist for a man gazing at the stars. No doubt the darkness is there, fundamental, pervasive and unconquerable ex-

cept at the pinpoints where the stars twinkle; but the problem is not why there is such darkness, but what is the light that breaks through it so remarkably; granting this light, why we have eyes to see it and hearts to be gladdened by it.—*George Santayana.*

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TABLE OF CONTENTS

NOVEMBER, 1956

Scientific Articles

- Colon: The Selection of Operation for Carcinoma in Different Segments—Peter A. Rosi, M.D., and Nicholas J. Capos, M.D., Chicago 679
- Plaster Casts: Application of Splinting Agents for Immobilization of Injuries—George E. Omer, Jr., M.D., El Paso 683
- Chlorpromazine and Reserpine: Limitations of Their Use in Office Practice—John A. Grimshaw, M.D., Topeka 687
- Iniencephalus: Description of an Abnormal Tubal Human Embryo—Paul G. Roofe, Ph.D., Lawrence 690

- Clinicopathological Conference—Fever With Progressive, Fatal Coma 696
- Myocardial Infarction: Study of Syndromes Related to Inadequate Oxygen Supply of the Myocardium—Senior Thesis 714

Editorials

- Rural Health 693
- Standard Medical Report 693
- Leading Causes of Death 694
- Diabetes Week—November 11 to 17, 1956 . . 694

Miscellaneous

- President's Page 692
- Just Browsing 695

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Volume LVII

NOVEMBER, 1956

No. 11

Colon

The Selection of Operation for Carcinoma of the Colon

PETER A. ROSI, M.D., and NICHOLAS J. CAPOS, M.D., *Chicago*

Because of its segmental blood supply and lymph drainage, the colon lends itself to radical resection for carcinoma. Physiologically, long segments of colon can be removed without any apparent disturbance of bowel function. In view of these facts, in planning operations for carcinoma of the colon, every attempt should be made to remove the tumor and its region of local spread and lymph node metastases. In order to obtain the greatest number of surgical cures for carcinoma of the colon, wide resection of the tumor and its avenues of spread should be done in all cases.

Radical resection of malignant tumor is accepted in principle by all surgeons. However, there is no uniform opinion as to the extent to which an operative procedure is to be carried in order to effect a cure. Resectability of carcinoma of the colon, particularly the large, often fixed, and infiltrating tumors, is governed not only by the training and experience of the surgeon but also by the acceptance of the fact that today, at least, surgery is the only hope for a cure or relief of symptoms.

In our own series of 385 patients with carcinoma of the colon operated upon in the period between 1940 and 1950, the carcinoma was resectable in 330, or a resectability rate of 86.6 per cent. The mortality rate in the resected cases was 3.3 per cent. In the 1950 to 1953 period there were 149 patients, of whom 144 were treated by resection, or a resectability rate of 96.6 per cent and a mortality rate of 5.5 per cent in the resected cases. Although the mortality is 2.2 per

cent greater in the 1950 to 1953 period, during which time the tumors were resected radically, our resectability rate increased 10 per cent, thereby giving an additional 7 to 8 per cent of operated patients greater comfort, if not a greater possibility of cure.

PREOPERATIVE PREPARATION AND ANESTHESIA

The generally accepted plan of preparing patients for colon surgery is by improving their general con-

Factors determining choice of operation are discussed, along with pre-operative preparation, anesthesia, and surgical procedures effective in various areas of the colon.

dition through high protein, high carbohydrate, low residue diet and multiple blood transfusions whenever necessary. The preoperative use of antibiotics, either the relatively nonabsorbable sulfonamides, namely Sulfasuxidine and Sulfathalidine, or one of the broad-spectrum antibiotics such as Aureomycin, terramycin, neomycin or Chloromycetin, in order to reduce the number of organisms in the colon, has added greatly to the safety of colon surgery. These drugs reduce the hazards of infection and have been responsible for the great reduction of morbidity and mortality. Although antibiotics are available today which will reduce the number of bacteria in the colon to low and clinically insignificant concentrations, evidence of toxicity has been demonstrated.

Presented at the 97th annual session, Kansas Medical Society, Topeka, May 2, 1956.

In our series there seemed to be little if any difference in postoperative morbidity and mortality between the preoperative use of Sulfasuxidine and Sulfathalidine, the preoperative administration of neomycin, Aureomycin, terramycin and Chloromycetin, alone or in conjunction with Sulfasuxidine. In the group of patients who were given either Aureomycin, terramycin or neomycin, we had three cases of pseudomembranous colitis, one of which proved fatal, and one fatal case of diffuse jejunitis, ileitis and colitis.

While these conditions had been known to occur before the introduction of antibiotics, the increased incidence of these complications seems to be more than a coincidence. The broad-spectrum antibiotics are invaluable and often life-saving; however, their use should be restricted to definitely established infections. They should not be used indiscriminately. Until less toxic drugs are available, it seems that the relatively nonabsorbable drugs such as Sulfasuxidine or Sulfathalidine, which are associated with fewer toxic sequelae, are more suitable for the preparation of the colon for surgery.

In the preparation of the gastrointestinal tract for surgery there is great need for an agent which will destroy the desquamated cancer cell in much the same way the antibiotics suppress bacterial activity. Tumors in the gastrointestinal tract give off isolated or clumps of cancer cells which lie free in the lumen of the bowel. These cells are frequently viable and can be locally transplanted during the surgical procedure, particularly if the bowel is resected and an open anastomosis is done. Much can be done to prevent local seeding of malignant cells during operation by careful attention to asepsis and discarding all instruments, needles, gloves, and drapes potentially contaminated by cancer cells; or by mechanically removing desquamated cells by rectal lavage just prior to a colon-rectal anastomosis. However, some viable malignant cells undoubtedly are spread locally and under suitable conditions grow into residual tumors.

Anesthesia has played an important role in the reduction of mortality and morbidity following colon surgery. There seems to be little difference in morbidity and mortality in the use of general as contrasted with spinal anesthesia. However, too little attention has been given to local anesthesia in the so-called poor risks, elderly and debilitated patients. It is surprising how frequently an extensive intestinal resection can be done under local procaine anesthesia and with little shock to the patient.

FACTORS DETERMINING CHOICE OF OPERATION

The choice of operation for carcinoma of the colon is determined by the site of the tumor, its local spread, and regional lymph node drainage. Clinicopathological

studies of Westhues, Gilchrist and David, Duke and Waugh have established the course of lymph node spread of carcinoma of the colon and also determined the rather limited spread of the carcinoma in the bowel wall, either proximally or distally to the tumor. As a result of these studies there has developed a generally uniform opinion among surgeons as to the amount of bowel which should be removed in order to eradicate the local spread of the malignancy in the bowel wall itself. There is no such uniformity of opinion as to the extent of lymph node resection necessary in order to effect the greatest number of cures. It may be that the disparity in statistics as to five or more years cure of cancer of the colon is a result of differences in the extent of resection of the potentially involved regional lymph nodes. These differences may occur between various segments of colon and between the results obtained by different surgeons.

In our follow-up studies of patients operated upon for cancer of the colon, the five-year survivals were better on the right than on the left side of the colon. Since the type of tumor and method of spread are essentially alike in all segments of the colon, it was felt that the extent of resection of the potentially involved lymph nodes was probably the cause of the fewer cures on the left as opposed to the right colon. In order to improve our postoperative curability of cancer of the colon, particularly on the left side, we have extended resections of the colon and mesentery so as to include the greatest number of lymph nodes that drain the involved segment of bowel.

CHOICE OF OPERATION IN VARIOUS AREAS

Cecum. Tumors of the cecum spread predominantly along the ileocolic group of lymph nodes. The greatest number of cures in this group of tumors can be obtained by a right hemicolectomy with resection of the terminal 20 cm. of ileum and the right colon along with their entire lymph node containing mesentery up to the midcolic artery. The continuity of the bowel is re-established with an end-to-end, end-to-side, or side-to-side anastomosis, whichever is most suitable.

Ascending Colon and Region of Hepatic Flexure. Tumors of the ascending colon and region of the hepatic flexure spread predominantly along the right colic and middle colic group of nodes. Resection of the right colon and transverse colon with all the lymph nodes along the right and middle colic arteries is a necessity in order to remove tumor and resectable lymph node metastases in this area. The continuity of the bowel is re-established with an anastomosis between the ileum and colon in the region of the splenic flexure.

Midtransverse Colon to Region of Splenic Flexure.

Tumors from the midtransverse colon to the region of the splenic flexure metastasize to lymph nodes that lie along an arterial arcade that reaches from the middle colic to the left colic arteries. From these chains of nodes, the tumor cells may reach the superior mesenteric, inferior mesenteric, and periaortic group of lymph nodes. In order to remove the tumor and the metastatic carcinomatous lymph nodes, the operation of choice would be a resection of the ascending, transverse, and descending colon with their entire group of regional nodes. The ileocolic, right, and middle colic arteries are ligated at their origin from the superior mesenteric artery; the left colic artery is ligated at its origin from the inferior mesenteric artery, and the lymph nodes around the inferior mesenteric artery and aorta are excised. The continuity of the bowel is re-established by anastomosing the ileum to the lower sigmoid colon.

Left Colon. Tumors of the left colon, from descending colon to rectum, have a definite pattern of upward spread from the regional lymph nodes to the lymph nodes around the inferior mesenteric artery and aorta. While the number of patients who have carcinomatous lymph node metastases to inferior mesenteric and periaortic groups of nodes and who have curable cancer has not been established and can be determined only by prolonged follow-up studies, operation for left colon carcinomas should include, with resection of the tumor, this entire lymph node bearing area.

In a study of 36 patients with carcinoma of the left colon in which lymph node spread was determined in formalin-fixed, surgically resected specimens, three patients, or eight per cent, had involved nodes along the inferior mesenteric artery from its origin at the aorta to its bifurcation, or approximately within 1 cm. of the aorta. Five patients, or 14 per cent, had carcinomatous nodes within 2 cm. of the aorta, and 8 patients, or 22 per cent, had malignant cells in nodes 3 cm. from the aorta. The increased amount of surgical trauma that results from the dissection of periaortic nodes and ligation of the inferior mesenteric artery does not affect postoperative morality or morbidity.

In our own series there were 119 patients with limited segmental resections of colon with one death and 49 patients with division of the inferior mesenteric artery at the aorta and dissection of periaortic nodes which reservedly is called left hemicolectomy, with no deaths. There were 136 patients who had a Miles type of abdominoperineal resection with 6 deaths, or a mortality rate of 4.4 per cent, and 55 patients who had an abdominoperineal resection with left hemicolectomy with three deaths, or a mortality rate of 5.5 per cent. The differences in morbidity and mortality rates between the limited segmental resec-

tions of the left colon and the extended resection or left hemicolectomy are statistically insignificant, so as to warrant the performance of a left hemicolectomy in all patients with left colon carcinoma.

Descending Colon and Sigmoid. Tumors of the descending colon and sigmoid metastasize to the regional lymph nodes, to the inferior mesenteric group of nodes, and to the nodes along the aorta. The operation of choice for this group of carcinomas is a resection of the left colon with its entire lymph node containing mesentery from the splenic flexure to the rectum, that is, left hemicolectomy. The continuity of the bowel is re-established by an anastomosis of the colon from the region of the splenic flexure to the rectum.

Rectosigmoid. Tumors in the region of the rectosigmoid, as shown by histological studies of resected tumor specimens, spread predominantly upward along the inferior mesenteric group of lymph nodes with little tendency to spread retrograde to lymph nodes below the lower edge of the tumor. Carcinomatous involved nodes are rarely found more than 4 cm. below the lower border of the tumor, although isolated instances are recorded in which metastatic carcinoma was found in lymph nodes that lay 10 to 15 cm. below the tumor. The results of these histological studies of resected specimens have been accepted by surgeons as guides in determining the length of colon to be resected proximal and distal to the carcinoma. Very little attention has been drawn to the fact that these studies were done on formalin-fixed specimens which may have contracted considerably as a result of the action of formalin.

In the transference to distances obtained from the study of formalin-fixed tumors back to the living patient, allowances must be made for the amount of contraction of the bowel after it is resected, which often is as much as 50 per cent, and allowance made for further retraction, if the bowel is fixed in formalin without first being pinned to a board so to maintain its original size. Since the length of resected bowel is rarely measured in its living state in the patient and in its fixed state in order to obtain the factor of contraction, the distances obtained in histological studies of resected specimens of bowel carcinomas are only approximate; they may often be only half to one-third the distances in the respective patient. If histological distances are interpreted without the knowledge of amount of specimen contraction, then they cannot be safely applied to the patient without first empirically assuming a contraction factor of two to three. If, for example, a carcinomatous lymph node is found 4 cm. below the tumor in an unpinned formalin-fixed specimen, in the patient this distance would probably have been about 8 to 12 cm. below the tumor.

The conflicting results of the high incidence of

local recurrences following segmental resection of carcinomas of the rectosigmoid in the face of limited retrograde spread in histological studies or resected specimens is probably due in part to the direct application of uncorrected histological distances to the patient with the result that local, probably resectable carcinomatous tissue is left in the patient. Also, underestimating the extent of retrograde spread of carcinoma may cause carcinomatous lymph nodes to be divided and malignant cells to be seeded locally. Because of these two potential dangers, it has been our practice never to attempt to do a segmental resection of carcinoma of the rectosigmoid unless 12 to 15 cm. of bowel with its mesentery, below the tumor, can be removed.

Tumors of the rectosigmoid spread through the lymph nodes along the superior hemorrhoidal, sigmoid, and inferior mesenteric arteries with possible retrograde spread to the lymph nodes as low as 10 to 12 cm. below the tumor. The entire left colon, up to the region of the splenic flexure, the regional lymph nodes up to and including the periaortic nodes around the origin of the inferior mesenteric artery, and about 15 cm. of bowel with its mesentery below the tumor should be resected in order to obtain the greatest number of cures.

The continuity of the bowel is re-established by an anastomosis between the colon from the region of the splenic flexure to the lower rectum. In those patients in whom it is not possible to remove from 12 to 15 cm. of bowel below the lower edge of the tumor, an abdominoperineal resection with left hemicolectomy is done.

Rectum. Carcinoma of the rectum, because of its location in the midst of the rich lymphatic network in the pelvis, spreads upward along the superior hemorrhoidal to the inferior mesenteric and periaortic nodes, but it also spreads laterally along the middle hemorrhoidal, hypogastric, and iliac group of lymph nodes. Because of this wide local dissemination of carcinoma of the rectum, complete eradication of the tumor tissue is difficult to accomplish.

Of the patients who presented themselves with residual carcinoma following abdominoperineal resection, as shown by Diddish, in 50 per cent the carcinoma was limited to the structures of the pelvis at the initial operation. The residual carcinoma was found especially in the posterior vaginal wall and in the fascia posterior to the prostate and seminal vesicles. Because of the extensive local spread of carcinoma of the rectum, operation should be planned so as to remove all the regions of tumor infiltration and metastases.

The operation of choice for rectal carcinomas is an abdominoperineal resection with resection of the

mesentery of the left colon up to the origin of the inferior mesenteric artery, which is divided from the aorta, and dissection of the periaortic lymph nodes. The colon in the region of the splenic flexure is brought out as a colostomy through a stab wound in the left upper quadrant.

Since metastatic carcinoma is found in lymph nodes along the middle hemorrhoidal, obturator, hypogastric, and iliac chain of lymph nodes in as high as 24 per cent of cases of advanced carcinomas of the rectum, abdominopelvic node dissection should be performed more frequently than it has been heretofore with the hope of increasing the curability of this group of tumors.

Carcinoma of the rectum which has extended into the pelvic urogenital system presents particular problems. In females in whom there is infiltration of the posterior vaginal wall or uterus by rectal carcinoma, resection of the genital tract, that is, ovaries, tubes, uterus, and vagina, along with the attached tumor, is necessary in order to give the greatest chance for a cure.

In males, extension of the rectal cancer into the urinary bladder may require a local resection of the bladder. Infiltration of the seminal vesicles and prostate may require excision of these organs, if the extension seems limited to them. If, however, tumor tissue has extended beyond these structures, complete removal of the pelvic viscera with implantation of the ureters into the bowel or on the skin, gives the patient his only hope for the relief of his symptoms or possible cure.

Patients who have undergone pelvic exenteration for rectal cancer have little difficulty in adjusting to the new way of life. The relief from pain and rectal bleeding more than compensates for the inconvenience of a wet colostomy or multiple abdominal wall stomata that result from transfer of the ureters to the colon, ileal conduit, artificial bladder, or to the skin.

Pelvic exenteration is a recent development in the treatment of advanced rectal cancer, and there is still insufficient statistical data to determine its role in the treatment of these infiltrating tumors. With new developments in surgical techniques and postoperative care, the operative mortality for pelvic exenteration is about 10 per cent, which is an acceptable mortality rate for a fatal disease. Pelvic exenteration, whenever possible to perform, is a more acceptable operation than the so-called palliative colostomy with the tumor left in situ. Palliative colostomy, except for the relief of symptoms of bowel obstruction, offers little or no relief from the ravages of this infiltrating tumor.

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Plaster Casts

Application of Splinting Agents for Immobilization of Injuries

GEORGE E. OMER, JR., M.D., *Fort Riley*

From the time of ancient Egyptian history, many different substances have been recorded as splinting agents for immobilization of injuries. As late as the last half of the 19th century, a list of agents used for stiffening mesh bandage fracture dressings would include starch, paraffin, glue, gum thickened with powdered chalk, silicate of soda, white of egg stirred with flour to form stiff batter, and plaster of Paris. Today the plaster of Paris bandage cast is the most versatile material in common use for immobilization of a fracture.

Plaster of Paris was used by the Arabians long before it was introduced as a casting agent in Europe early in the 19th century. The early casting technique consisted of placing the injured limb in a trough into which the liquid plaster was poured. After the plaster dried, the limb and its encasing moulded cast was broken free from the trough. This awkward method was replaced in 1852 when Antonius Mathijssen, a Flemish Army surgeon, devised the method of using a mesh bandage impregnated with plaster of Paris. Two years later the plaster bandage was used extensively in the Crimean War and became the standard technique for fracture immobilization.

Plaster of Paris is produced by heating gypsum, or calcium sulfate, until the water of crystallization evaporates. In its natural state, gypsum contains approximately 21 per cent water of crystallization. In the manufacturing process, all but approximately six per cent of the water is evaporated. The dehydrated gypsum is plaster of Paris. When water is added to the dry plaster of Paris powder, the action is reversed and moisture is taken up to form crystals of gypsum. This plaster "setting" mechanism produces considerable heat and is accomplished when the chemical formation and interlocking of the gypsum crystals is completed. Practically, setting is complete when heat is no longer given off from the cast.

Plaster of Paris bandages are manufactured by several reliable companies and practically all plaster of Paris now on the market is consistently good. Luck⁴ demonstrated that more unsatisfactory plaster casts are the result of poor technique of application than the result of defective plaster. In an emergency, plas-

ter bandages can be made from ordinary crinoline bandages and dental plaster of Paris. The plaster powder is rubbed into the meshes of the crinoline, and the bandage is loosely rolled. The setting of this substitute plaster bandage can be speeded by adding three or four teaspoonfuls of salt per quart of water. Commercial fast-setting plaster bandages placed in

Many failures in the treatment of fractures can be traced to inadequate application of plaster casts. Good fracture results involve careful attention to position, padding, equal distribution, and uniform thickness of plaster bandages.

salted water may produce too much heat and result in a burned patient.

A plaster cast should be applied while the patient is lying down on a narrow slightly padded table that is a convenient height for the surgeon. If the patient watches the rolling of the plaster bandages, it becomes difficult for him to relax. Plaster cast application is thus best performed with the relaxed patient lying down and his interest diverted from the operation as much as possible.

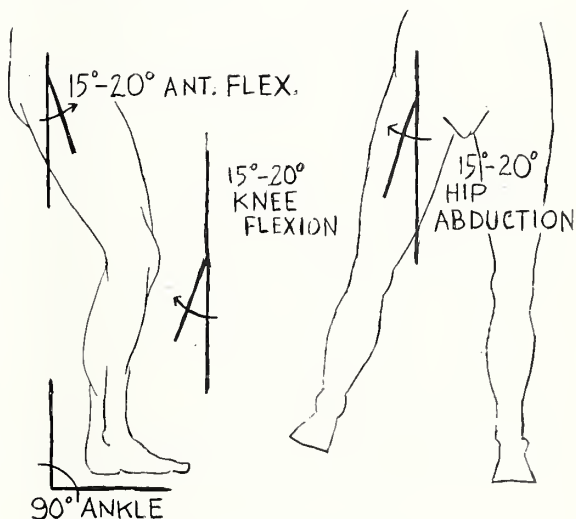


Figure 1. The functional position of the lower extremity.

The author, formerly of Kansas City and now a major in the Army Medical Corps, is serving as chief of Orthopaedic Surgery Service at U. S. Army Hospital, Fort Riley.

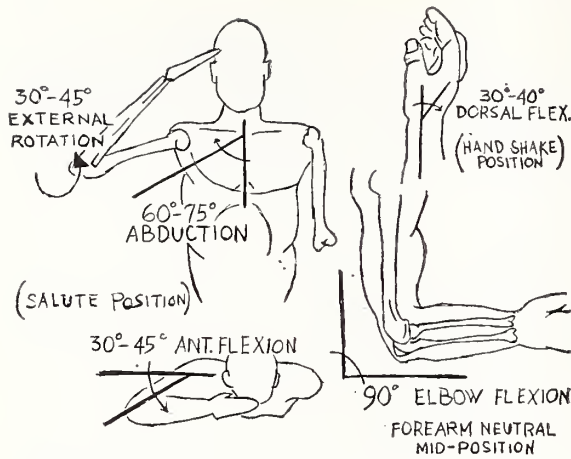


Figure 2. The functional position of the upper extremity.

In applying a plaster cast the surgeon holds the extremity or occasionally supports it by a special apparatus such as an overhead sling. It is better for the more experienced surgeon to support and position the injured extremity while the less experienced operator applies the plaster rolls. If the lower extremity is involved, two assistants are required for the important functional angles of the hip, knee, and tarsal joints. The most important single feature in the proper application of a plaster cast is to secure the proper functional position of the injured part.

The functional position of the ankle joint is 90 degrees or at right angles with the long axis of the leg. The other tarsal joints should be moulded to maintain a normal arch and to prevent rotation of the foot from its normal axis. The knee joint should be placed at 15 degrees of flexion from a fully extended position. If the hip joint is included in a spica-cast, the joint should be in 15 to 20 degrees of flexion and 15 to 20 degrees of abduction.

The wrist should be in a hand-shaking position, with 30 to 40 degrees of dorsiflexion at the carpal joint and the interphalangeal joints in 45 degrees of flexion. The elbow is best maintained at 90 degrees of flexion or at right angles with the long axis of the arm. The forearm is placed in a neutral or midline position with the thumb up and the little finger down. The shoulder joint should usually be maintained in the salute position, with 60 to 75 degrees of abduction, 45 degrees of anterior flexion, and 45 degrees of external rotation (Figures 1 and 2).

During the entire period of application and setting of the plaster cast, all joints of the involved extremity should be aligned and maintained in a position of function.

A protective padded covering for the skin is applied after the desired position and alignment of the

involved extremity have been secured. The protective padding and the overlying plaster bandage should extend proximal or above and distal or below the first major joint adjacent to the injury (Figure 3). Thus, a tibial fracture should be immobilized in a long leg cast that includes the foot and the thigh.

If the injury is acute with associated hematoma and edema of the extremity, a layer of sheet wadding should lie next to the skin as padding. Sheet wadding is a thin non-absorbent cotton batting. It is applied by rolling it on the limb, rather than pulling or twisting, and it should accurately conform to the contour of the extremity. Bony protuberances and subcutaneous nerves should receive extra padding (Figure 4). The added padding should be carefully placed. Displaced or bulky padding is not only ineffective but may result in increased chafing and skin irritation.

If swelling is not anticipated, stockinette may be applied as the immediate skin covering. Stockinette is a seamless tubular knit cotton fabric. The proper



Figure 3. A long leg cast. Note the rounded-arc walker and toe plate for protection during ambulation.

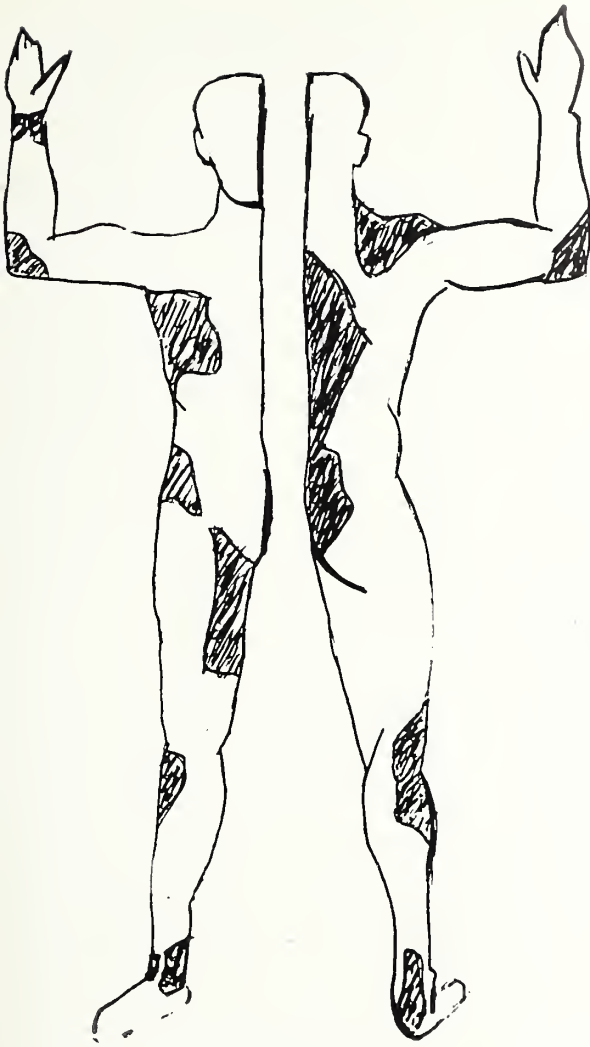


Figure 4. The body areas that require protective padding.

width stockinette is pulled over the limb with special care to smooth all wrinkles. Spot padding over stockinette is usually composed of soft wool felt or foam rubber of medium density. All spot padding should be anchored with sheet wadding before the actual wrapping of the plaster bandage is accomplished.

After the extremity has received protective padding, an appropriate width of plaster bandage should be selected. For example, a plaster bandage six inches wide is too bulky for use on any extremity of a six weeks old child.

The selected bandage roll is placed on one end in water deep enough to cover the entire bandage. Sufficient water should be available so that it may be changed after every few rolls of plaster and kept clear and clean. Cool water retards setting time and warm water accelerates the setting time, so the temperature

of the water should depend on the operator and his technical speed of cast application. The bandage roll is saturated with water when bubbles no longer rise to the surface. The roll is then grasped at both ends and lifted from the water. Excess water is gently squeezed from the roll by pushing both hands toward the middle. The bandage roll should not be bent or twisted (Figure 5). The roll should be squeezed out over a separate container since excessive plaster particles collected in the bottom of the water basin will act as "feeding agents" and accelerate the setting time of the plaster.

The loose leading edge of the plaster roll is fitted to the extremity and then rolled onto the limb like a rug. The roll of plaster bandage remains in contact with the surface of the limb and is not lifted, twisted, or placed under tension or pull. The bandage should be allowed to turn in the direction in which it will lie flat, and the plaster is advanced down the extremity by overlapping each turn of the bandage by approximately half its width. Each turn is applied carefully, and the surgeon's hands should follow the natural inclination of the bandage roll without forcing it into a twisted position. At tapering parts of the limb the turns are made to lie evenly by utilizing small "tucks" that are made in the redundant edge of the

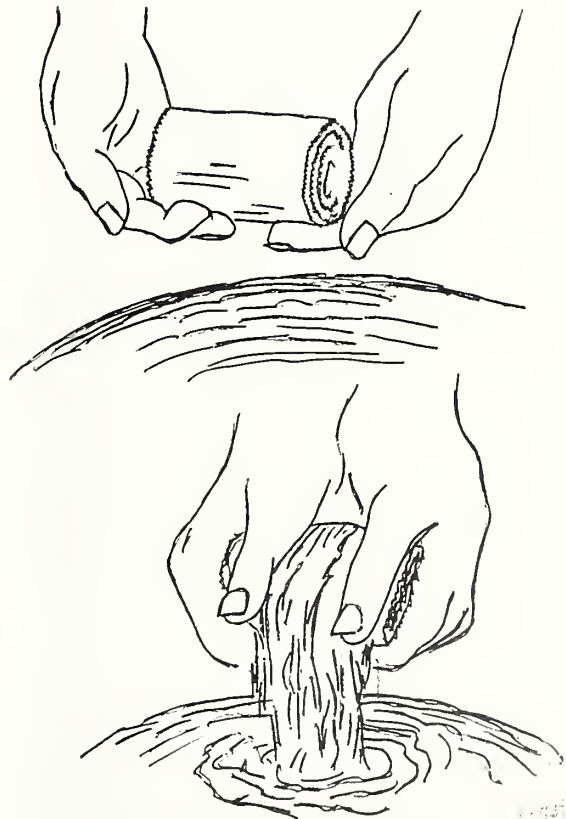


Figure 5. Technique of handling moist plaster rolls.

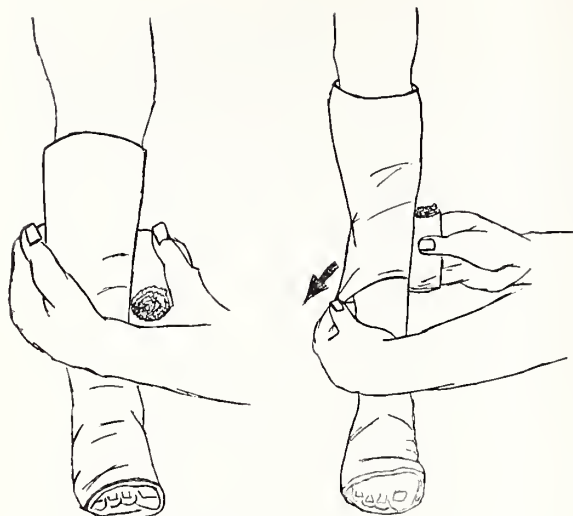


Figure 6. Technique of rolling plaster bandages.

plaster roll with a quick movement of the index finger before each turn is moved into final position (Figure 6). While the major hand is engaged in the rolling-on process, the flat of the minor hand is constantly smoothing and rubbing the plaster. The durability of the cast and its strength for any given weight depend on the welding together of the individual plaster turns by these smoothing movements of the hands.

The surgeon and his assistants should support the plaster cast with the flat of their hands and not with their fingers. Finger pressure produces ridges in the plaster and results in uneven cutaneous pressure. It cannot be over-emphasized that internal folds and wrinkles in a cast result in pressure sores and tissue necrosis. The hands should move constantly and rub and work the plaster for a smooth consistency and even tension.

The pressure made by the plaster bandages should be evenly distributed since tension on a circular bandage is cumulative and may build up to a point of dangerous constriction. To insure even pressure and to guard against a sharp cutting edge, the plaster bandage should be centrally placed in a deep flexure such as the knee joint. It is also more desirable to cut the plaster roll than to reverse its direction in a deep flexure such as the elbow or knee joints.

No single factor has more influence on the ultimate effectiveness and strength of the plaster cast than the maintenance of immobility during the period of setting. Any attempt at manipulation or realignment during this period results in a greatly weakened cast. Tests conducted by Luck⁴ showed a 77 per cent reduction in the strength of plaster casts which were bent during this critical period. During the period of setting a heat cradle is usually not indicated, but the cast should be left uncovered in order that it may dry out as much as possible.

If marked swelling or edema of the extremity is anticipated, the cast should be split in a convenient location, such as the anterior aspect. A second technique is a bivalved or bisected cast where one-half of the cast is easily lifted up for inspection. A split cast can be removed without special tools. If a person with an acute fracture is to be transported, the cast should always be split. It is imperative that all components of the dressing are split; a single turn of sheet wadding against the skin is as constrictive as the entire overlying plaster.

Many failures in the treatment of fractures can be traced to inadequate application of the plaster cast. A good plaster cast can be applied only if the involved extremity is in good functional position, the padded covering of the limb is adequately placed without being bulky, the plaster bandage has been smoothly rolled with equal distribution of pressure and uniform thickness, and the cast has been kept immobile until the plaster has thoroughly "set." Adequate skill in plaster cast application is not to be found in the textbook; it can be learned only by a process of continuous repetition.

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When all the mountains in the world have been scaled, when the poles hold no more secrets, when the last acre of the last continent has been traversed, when, in short, everything on our planet is known and catalogued, the way will still be open for discovery. The world will never be conquered so long as the zest for conquest, for adventure, is in men's hearts.

—Maurice Herzog

Chlorpromazine and Reserpine

Limitations of Their Use in Office Practice

JOHN A. GRIMSHAW, M.D., *Topeka*

So much has been said about the value of chlorpromazine and reserpine in the last two years that I feel some discussion of their failures and limitations is appropriate. Conservative estimates indicate that approximately 5 tons of chlorpromazine alone was ingested in the last year in the United States and that much of this was prescribed by physicians other than psychiatrists.

Although most published data concerning these drugs are to be found in psychiatric journals, we must be aware that the drugs are being widely used for emotional problems by non-psychiatrists. It is to them that this paper is directed, to share with them some observations from an intensive study of a few cases in a setting similar to that of their own patients rather than a statistical study of state hospital patients such as already has been done repeatedly. Studies of psychiatric patients in an office setting have not been common.

In the first place, let me state that the much heralded "psychiatric revolution" which was supposed to result from the introduction of these "tranquilizers" or ataractics has settled down to a more calm appraisal and less emotional and more realistic conclusions. These drugs are without question valuable additions to the treatment of anxiety, and it is most probable that new and better drugs will follow, but it must be remembered that there are limitations, dangers, and unpredictable disappointments in the use of the present ones. These dangers can be minimized and the disappointments averted if we keep in mind the limitations this paper will discuss.

Statistical studies indicating percentages of success and failure are misleading and so far are concerned almost exclusively with hospitalized psychiatric patients. The setting of office practice and the types of patient dealt with are so different from state hospital experience that comparison of results is impossible. It is also difficult to define success or failure accurately and to have adequate controls of scientific method.

Because of these difficulties, then, my own statistical results are not significant from the standpoint of accurately defining the value of these drugs. I have, however, given these drugs only to patients in whom

there was some reason to anticipate success, and in this selected group one should expect the best results.

In this selected group, a total of 38 patients, 63 per cent had good results and 37 per cent were deemed failures in therapy. These figures are rendered still more conservative by the fact that many of the "good results" group may well have been due to other therapies given simultaneously rather than to the drug alone. Supportive measures, expressive psychotherapy, occupational therapies, and environmental manipulations were employed wherever indicated in addition to the drugs, and it is clear that without such supplementation results would be worse than reported above.

Although ataractics have an important place in management of certain personality disorders, they have limitations and are subject to abuse. The need for further research on such drugs is stressed.

My statistics are given only as a rough indication that many failures occur, and it is with these failures that this paper is primarily concerned. A study has indicated the following classifications of failures:

- A. Lack of favorable outcome predicted
 1. If depression is the chief or only symptom.
 2. When given in insufficient dosage.
 3. Where environmental stress is a major factor.
 4. When obsessive-compulsive features exist.
 5. When a change in basic character structure would be necessary.
 6. When these drugs are used as an easy substitute for proper study and diagnosis.
 7. Where the drug is used alone instead of as an adjunct to other therapies.
 8. To obtain social compliance despite continuance of obvious etiologic factors.
 9. Failures due to unknown causes when known factors for success seem satisfied.
- B. Adverse effects of the drugs necessitating discontinuance despite temporary favorable outcome or with insufficient trial.
 1. Side effects

From the Department of Psychiatry, Topeka Medical Center, Topeka.

Drowsiness, vasomotor instability, muscular weakness.

2. Toxic effects

Jaundice, allergy, agranulocytosis.

A discussion of the above classification will make it more concrete:

1. Many authors have mentioned the worsening of depression with the use of chlorpromazine and reserpine, and attempts have been made more recently to circumvent this by the addition of amphetamines to the prescription. In general where depression is accompanied by psychomotor retardation, feelings of worthlessness, lethargy, disinterest in activities, and such, these drugs are either useless or harmful. But depression of mood with anxiety, agitation, worries, and obsessive thoughts can often be helped by the ataractics. If one keeps in mind that these drugs are valuable in the treatment of *anxiety* and utilizes them primarily for that purpose, then the actual diagnosis or the presence of other symptom complexes should not act as contraindications.

One of our patients, for example, an elderly woman, was so distraught by panic-like anxiety reactions that she became morose, pessimistic, and contemplated suicide. Certainly those were depressive symptoms, but it was felt that anxiety was the chief difficulty and she was placed on large doses of chlorpromazine with great relief. Unfortunately she lived at some distance and was not seen by her family physician for about two months. Her husband had taken the chlorpromazine away from her, and all her original symptoms had recurred. She hanged herself three days later. It is probable that chlorpromazine might actually have prevented suicide in this depressed and anxious woman if it had been continued.

2. Cases of insufficient dosage are commonly seen by the psychiatric consultant. Medical and surgical uses of these drugs, especially chlorpromazine, require relatively small doses, but the relief of massive anxiety sometimes requires huge doses. Since toxic symptoms are not related to total dosage alone, it is generally safe to push dosages to the point where adverse side reactions appear or clinical relief has been accomplished before assuming the drug has failed. I have had some patients on doses as high as 1200 mgs. daily, and doses much higher than this are recorded in the literature. My average dose is much smaller, however, approximately 300 mgs., and I follow all patients carefully for toxic signs, including frequent white blood counts for agranulocytosis.

3. If environmental factors are apparently the major cause of anxiety, it seems that failure of these drugs is more likely. Indeed, even if such potent drugs existed as to tranquilize these patients, their use seems questionable. Let us remember that there

are some situations that should be corrected of themselves, and tranquility or equanimity in the face of them would be *abnormal*, especially if it led to acceptance and complacency. In some situations it might be wise to consider that anxiety is acting as a beneficial goad to stimulate action in the direction of changing an adverse situation rather than quietly yielding to it.

4. Obsessive-compulsive states with severe anxiety, phobias, fears of going crazy, and many somatic complaints are sometimes relieved and sometimes not. My experience is about equally divided among successes and failures in such cases, and I know no way of predicting in advance what the response will be. Patients who have seemed to me to be parallel in every way have reacted differently. I suggest that the drugs be used empirically in such cases.

5. Medication cannot be expected to change basic character structure or life-long modes of adapting to stress that are typical of "psychopaths," those with personality disorders, inadequate characters, etc. If symptoms are primarily due to these causes, failures will result. In this group of patients anxiety is rarely felt as such, and it is usually handled by acting out— attempts to alter the environment, or by the expectations of passively foisting themselves on people around them. Since these drugs are chiefly useful in controlling overt, consciously perceived anxiety, their failure to help in such cases can be understood. In fact it is probable that in many such cases they might be contraindicated; they might release what few inhibitions such patients normally possess and lead to further socially unacceptable behavior. It is well known that lobotomy sometimes has such effects, and the use of these drugs sometimes leads to results quite similar to lobotomy.

6. Use of these drugs for convenient and immediate relief of the urgent complaints of patients is common and, of itself, is usually to be commended. If, however, no further attempts are made to discover the causes of the original symptoms, it might be possible to miss situations that need more definitive treatment. As with morphine, no one would practice medicine without it at times, but everyone would be cautious that its use did not mask underlying conditions requiring attention. So with ataractics. We must not be lulled into diagnostic apathy by the absence of complaints following their use. True, we are not always able to find etiological relationships in psychiatric illnesses, and the use of these drugs should not be excluded because of this, but an adequate history, a physical examination with appropriate laboratory studies, and a simple mental status or psychiatric interview should be the minimum. This is not to imply

that every such patient should be seen in psychiatric consultation, but the physician should at least attempt to rule out acute schizophrenic conditions, organic brain disease, drug intoxications, or general metabolic diseases leading to personality changes. Ataractics might even be used in such conditions, but other forms of treatment exist for them and might be preferable.

7. These medications are not to be regarded as the sole form of treatment. For many years before the "ataractic revolution," anxious patients were managed, for the most part quite adequately, by the physician who was willing and able to spend some time in supervising their daily routine, prescribing activities, allowing them to catharse by patient listening, or by more formal psychotherapy. It is my practice to emphasize to all my patients that these drugs are only a supplement to a total prescription of management devices.

8. The continuance of etiological factors which remain uncorrected can be a cause of failure though often we can obtain apparent remissions, changes in behavior, social compliance. We are not sure that all such change is the result of lessened anxiety; sometimes it is the result of a sort of apathetic disinterest, a lobotomy-like effect which is not always desirable.

Frequently patients, and more frequently their families, indicate that relief from anxiety has been marked, but replacing it has been a dull, lethargic, emotionless automaton that isn't human. Symptoms are often the symbolic language of the patient—his way of calling attention to situations that cry out for correction. This is often the case in behavioral problems of children, and merely suppressing these symptoms by pharmacologic means is not good medical practice. Again, because these drugs are sometimes effective in suppressing these symptoms, we may be led to complacency because of their convenience. What such patients need is psychotherapy. Despite its inconveniences, it is directed to underlying problems and not merely to covering them up. There are, of course, many situations that make this treatment of choice impossible and the ataractics are of tremendous value here, but mature judgment is needed to make this decision. Get a psychiatric consultation in such cases.

9. There are still failures that we cannot account for. The complexities of the dynamics of the personality, the physiology of anxiety, and the pharmacology of these drugs must in some unknown ways account for such failures. No doubt in the near future newer drugs will be more uniformly effective, less toxic, more predictable.

In this paper I have not concerned myself with adverse effects of the drugs such as side effects and toxic effects. These have been described elsewhere, and although there no doubt is more to be added to our knowledge of them, I feel I have little of interest to contribute at this time with one exception: muscular weakness, tiredness, lassitude are noticed in many of our patients and do not always seem to be part of a depressive reaction, though patients with depression may complain of these on a psychological basis. We believe these symptoms in many cases are physiological. This seems to be borne out by changing such patients to some of the newer ataractics, some of which seem to control anxiety without causing these side effects.

SUMMARY

1. Ataractics have an important place in the modern management of certain personality disorders, many of which come to the attention of the general practitioner.

2. These new drugs have certain limitations and abuses, some of which have been outlined here.

3. The physician is warned against complacent inattention to etiological and dynamic factors that may be operating and which may be instigated by the convenience and physiological effectiveness of these drugs.

4. Further research will produce more drugs whose physiological effectiveness and pharmacological drawbacks will enhance their convenience and also these dangers.

5. Further study conducted over a period of years is necessary to determine total effects on personality, especially in the developing personalities of children, from these drugs.

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The great problems of the age, international, national and corporate, have to do with the relationships of people. One must be skilled in getting along with others. But this skill must rest upon some such foundation as this: Technical competence; broad intellectual outlook; high sense of honor—moral and spiritual values; attention to the public interest; understanding and appreciation of human relationships.

—Robert N. Hilbert

Iniencephalus

Description of an Abnormal Tubal Human Embryo

PAUL G. ROOFE, Ph.D., *Lawrence*

This paper has two purposes:

1. To describe an abnormal tubal 3 mm. human embryo, iniencephalus.

2. To request specimens of human embryos of less than a menstrual age of five or six weeks with special notes on their handling.

The abnormal tubal 3 mm. human embryo, iniencephalus, pictured in Figure 2 was obtained in July 1955 by Dr. L. Claire Hays, Hays Hospital, Cedar Vale. A summary of the detailed history is interpreted as follows:

"A normal period was early in May. Conception occurred late in May if we consider the bleeding of June 6-7 as the 'placental sign' which occasionally occurs at about the time of the expected menstrual

period. Development then proceeded for from four to five weeks, to judge from the appearance of the embryo. The flow of July 1 appeared after the death of the product of conception. This agrees with the degenerated placenta and the macerated condition of the embryo."

This is a rare specimen of a monster known as iniencephalus. No doubt the ectopic condition contributed to the abnormality. Our knowledge of causes of abnormal growth is limited. Here we see the dorsal flexure of the 18-21 somite period.

Causative factors involved in abnormal development

The embryo described is of interest because of its rarity. A request is made for additional specimens.



Figure 1. Normal human embryo, 4½ weeks (menstrual age), from Department of Embryology, Carnegie Institution of Washington.

are little known. They undoubtedly can be related to two major areas, heredity and environment. In the present case no doubt the ectopic (tubal) position might be assigned as a reasonable agent for the furrowed occiput and enlarged brain. We cannot assign a blanket causative agent that is responsible for developmental abnormalities. There are definite Mendelian factors operating in such defects as the lack of all or parts of appendages. Another hereditary trait, achondroplasia, is in this category. Cleft palate and cleft lip may readily be Mendelian recessive.

On the environmental side we have very little to go on. Physical factors, such as temperature and radiation, play a major role in producing abnormalities. Temperature, however, may be ruled out in the case of mammalian irregularities of form and structure. However, x-rays and other types of ionizing radiation play a considerable role, especially at the experimental level.

It has been proved experimentally that vitamin deficiency in rats will regularly produce measured abnormal skeletal defects.

Factors influencing abnormalities do so in various stages. One factor may operate in early development and fail to do so in later stages. Some systems are more sensitive than others to these physical and chem-



Figure 2. Abnormal human embryo, 4½ weeks (menstrual age), iniencephalus, from Department of Embryology, Carnegie Institution of Washington.

ical factors. Certain inhibiting and accelerating stimuli need not act long. They need to operate only at short

intervals during critical periods to produce pronounced abnormalities.

Our aim is not to collect abnormal specimens of embryos or fetuses. What we need and need badly in this area are specimens of human embryos under four or five weeks of menstrual age. Another age group would be fetuses from the third trimester. We use these in many ways in human gross anatomy. Our plastic models of this age group are of considerable value in teaching.

In handling of all specimens it is best, of course, to obtain the material as near as possible to the living state. The specimen should be placed in 10 per cent formalin, and the volume used should be at least 10 times the volume of the specimen. Ship by express, collect, to the Anatomy Department, University of Kansas School of Medicine, Lawrence, Kansas. The container should be absolutely filled to prevent movements of the specimen. If it is packed loosely with absorbent cotton, so much the better. A strict complete case history of the menses and other pertinent data will make possible a scientific understanding of the development of the embryo. This material will be handled discreetly, scientifically, and with care.

Figure 1 is a photograph of a normal 4½-weeks-old human embryo (menstrual age). This permits comparison with the iniencephalus (Figure 2) of similar age.

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The medical profession has been described as being divided as Gaul was, in three parts. One—the active member, always willing to help in every worthwhile action, willing to sacrifice some of his time for the profession or public good. Two—the complacent member, who is theoretically enlisted in the activities of the organized bodies, but actually does nothing more than occasionally attend a meeting. Third—a minority, who simply don't give a damn for anything that does not give them a personal profit.

The profession lives because of the first class. By some form of inciting interest, or even, by compulsory requirements of participation, many, if not most of the second class may be brought into class 1. The third class ought to be eliminated from our efforts and our councils. They are parasites and we will be stronger without them. Why should we hesitate to dismiss them by attendance rules, fair but sternly administered? Those who will not participate, ought not enjoy the benefits available to those who give freely of themselves, their time, and their money. I am not a believer in the desirability of having every medical man in the society. Let it be a privilege gained by effort and participation.

W. U. Kennedy, M.D., *President's Page*
Journal of the Indiana State Medical Association

PRESIDENT'S PAGE

DEAR DOCTOR:

The emergency session of the House of Delegates was held in Wichita on October 28, and the following action was taken:

(1) The military dependents' care program was approved, designating Blue Shield as the fiscal agent and the medical society as the administrative agent, adopting a fee schedule similar to the Blue Shield \$6,000 proposal of a year ago, and authorizing the president to sign a contract in Washington on November 9.

(2) The proposed A.M.A. Code of Ethics, a copy of which was received by all of you, was not approved. Kansas delegates were instructed to do all in their power to defeat that proposal. If they are successful, the Code of Ethics will remain as it now stands.

(3) The House of Delegates unanimously approved amendments to the Basic Science Act and a newly written Healing Arts Act for Kansas.

Another event of significance occurred during the past month—formation of the American Association of Medical Assistants (A.A.M.A.). The group became an official organization with the adoption of a constitution and by-laws at a meeting in Milwaukee on October 27. The Kansas Medical Society is proud of the honor bestowed on the state in the election of Miss Maxine Williams of Kansas City as first president of the national group. We are confident that she will perform the duties of her office with distinction. Kansas was well represented at Milwaukee, and it is my hope that more of us will send representatives to the next national meeting, to be held in San Francisco in October of 1957.

Fraternally,

Clyde H. Miller M.D.

President

EDITORIAL COMMENT

Rural Health

The National Conference on Rural Health will be held at Wichita in 1959, as a feature of the centennial celebration of the Kansas Medical Society. The correspondence between the American Medical Association and this office, printed below, tells the story.

September 13, 1956

"Dear Mr. Ebel:

"As Chairman of the Council on Rural Health of the American Medical Association, it is my pleasure to inform you that the Council, meeting in session on September 9, voted unanimously to accept the gracious invitation of The Kansas Medical Society, along with invitations from other leading organizations, and hold its Fourteenth National Conference on Rural Health in Wichita, Kansas, March 5-7, 1959. The Broadview Hotel has been designated as the official headquarters hotel for this meeting.

"Will you please convey to the members of your House of Delegates our appreciation of their consideration and interest.

"In the months ahead we shall look forward to working very closely with you, in order to plan for a most successful National Conference in Wichita.

Cordially yours,

(Signed)

F. S. CROCKETT, M.D., *Chairman*
Council on Rural Health"

October 16, 1956

"Dear Doctor Crockett:

"We are enormously pleased and very deeply challenged by your letter stating that Wichita has been selected for the 1959 National Conference on Rural Health. We shall try our very best to make this meeting completely fulfill all your hopes for such an occasion.

"Clyde W. Miller, M.D., President, has already appointed two committees who will separately and together assist you in the preparations for this event. The chairman of our Committee on Rural Health is V. E. Brown, M.D. of Sabetha. The chairman of the committee planning our Centennial Year is Thomas P. Butcher, M.D. of Emporia. He will, if usual customs prevail, be president of The Kansas Medical Society during that year. We in this office serve as secretaries to both committees and will be pleased to write you from time to time in the near future concerning suggestions these committees might have, or asking questions of you about things the committees might do.

"We are experiencing a feeling of pride over the fact that your National Conference on Rural Health will come to Kansas during our Centennial Celebration and wish to state that the Council of The Kansas Medical Society in formal action taken at Topeka on Sunday, September 30, 1956, authorized the Executive Office to assist you in every possible way in completing local arrangements for the meeting. We in this office are pleased for the opportunity to work with you.

"Again thanks and with best wishes, I remain

Very truly yours,

(Signed)

OLIVER E. EBEL,
Executive Secretary"

Standard Medical Report

The Kansas Medical Society has approved a standard form for reports to insurance companies. After several years' study by the Committee on Medical Economics, a very brief and concise form has been devised. It is modeled after some already in use by other state medical societies where the procedure appears to meet with satisfaction.

For years, physicians have complained because of the time spent in completing form reports. This is augmented because of the fact that many different forms exist and each report is different from the last. Insurance companies are not overly insistent upon their particular report blank. They want the information and appear to be satisfied with standard forms adopted by state medical societies. We, therefore, do not anticipate any problem with insurance companies.

The Kansas approved blank will shortly be mailed with an order blank. Your use of this is strictly optional and not at all required. The Kansas Medical Society is making this available as a personal service to its members, but no one is required to change whatever system he may prefer to use in its stead.

This approved form will give your name and address at the top. In a box it states that the use of this form is approved by the Kansas Medical Society, that the report is supplied without charge, and that additional reports if desired may be had at a cost of \$3.00 each.

The body of the report is the center section of one side of a standard size typewriter page. It offers space for identifying the patient, your diagnosis, treatment, prognosis and remarks. On the bottom, below the physician's signature, is a line to be signed by the patient authorizing the report and assigning the benefits if applicable. The paper is light enough to make the preparation of a carbon copy easy.

These standard insurance report forms will be prepared in pads and can be purchased, because of the large volume, at much less than the cost of an individual order. The announcement will be received soon and will carry complete information on cost, etc.

Your Kansas Medical Society believes the use of this form will save the physician's time and is pleased to offer another project of the Committee on Medical Economics as a service to its members.

Leading Causes of Death

The Health Information Foundation, of New York, recently issued a brochure on changes in leading causes of death. The following material is paraphrased from that report.

In 1900 the three leading causes of deaths were communicable diseases, pneumonia-influenza, tuberculosis, and the disease group which includes diarrhea, enteritis, and infective ulceration of the intestines. These diseases accounted for slightly over 31 per cent of all deaths in 1900 but less than 5 per cent in 1954.

The death rate from the pneumonia-influenza category declined 86 per cent; from 12 per cent of the total in 1900 to one per cent in 1954.

The second greatest cause of death in 1900, tuberculosis, declined 94 per cent. Had the 1900 rate prevailed in 1954, there would have been an additional 283,000 deaths from this cause which would have been more than the actual number of deaths from cancer, the second greatest cause of death today.

The death rate from diarrhea and other gastrointestinal conditions has declined 96 per cent since 1900 and by 1940 was no longer in the first ten.

Diphtheria was tenth among the causes of death in the United States in 1900. This rate has declined by 99 per cent since then. Similar declines have occurred in other common communicable diseases.

The major causes of death today are the so-called degenerative diseases and accidents. Heart disease, the leading cause of death today, resulted in over 550,000 deaths in 1954. This is an increase of 129 per cent since 1900. This single cause accounted for 37 per cent of all deaths.

Cancer, with 237,000 deaths in 1954, was second. It accounted for only 4 per cent of the total deaths in 1900 and 16 per cent in 1954 for an over-all increase of 127 per cent.

Vascular lesions, including cerebral hemorrhage, rank third and have remained relatively constant during the past fifty years.

Although accidents rank fourth as a cause of death

for the total population, they are the first cause for the ages one through twenty-four years, claiming 34 per cent of all deaths among children one through fourteen years and 52 per cent of the deaths in the ages fifteen through twenty-four years.

The meaning behind these figures and their relationships are, of course, readily understood by physicians. It is felt that the figures and the statistics might be of interest.

Diabetes Week—November 11 to 17, 1956

The American Diabetes Association has set aside this week as National Diabetes Detection Week and is widely publicizing the event. It is suggested that every man, woman and child shall be tested for diabetes during the week of November 11-17, 1956.

The public is being told that one person in seventy-five is a diabetic; that there are two million in the United States of whom one-half do not know they have the ailment. It is estimated that 4,750,000 additional persons living today will develop diabetes during their lifetime, at a rate of 65,000 each year.

The public is being told that the detection test is simple and takes only a few minutes. They are advised for their own protection and health to have this test taken, and some who heed this advice will come to physicians' offices. The doctor, therefore, should know that this week is Detection Week.

Radioactive Isotope Work in Hutchinson

Grace Hospital and St. Elizabeth's Hospital, Hutchinson, have been approved by the Atomic Energy Commission for radioactive isotope work. The permits for both hospitals allow radioactive iodine uptake studies, Cobalt 60 Vitamin B 12 study for pernicious anemia, use of radioactive iodine for therapy purposes, and use of radioactive phosphorus for leukemia and polycythemia.

A grant of \$5,000 for a study of children in rheumatic and non-rheumatic families has been awarded the Department of Medical Microbiology at the University of Kansas School of Medicine by the American Heart Association. This is part of a continuing grant-in-aid approved for three years.

Dr. Tom R. Hamilton is chairman of the department. Dr. Antoni M. Diehl has developed the project with Dr. Wallace Lane, retiring director of the Kansas City-Wyandotte County Health Department, and Dr. Robert W. Weber.



"Cases of disease present, as we say, certain leading symptoms. They thrust forward, like a soldier who presents arms, a complaint such as pain, cough, or 'nervousness,' so that it occupies the foreground of the clinical picture. Such a '*presenting symptom*,' comparable to the '*presenting part*' in obstetrics, may turn out to be of minor importance when we have studied the whole case. But at the outset it has the power to lead us toward right or wrong conclusions in diagnosis, prognosis, and treatment, according as we have or have not learned the art of following it up.

". . . the complaints of the patient—fragmentary expressions of the underlying disease—should be used as *leads*, [which] can be followed to the actual seat of the disease. . . .

"Diagnoses are missed—(a) Usually because physical signs are not recognized; (b) occasionally because we do not think correctly.

". . . correct diagnosis depends upon what enters the doctor's head as possible, and on what his head does to sift the possibilities after they have entered it, as well as on the direct recognition of signs by physical examination.

"To throw open the mind's door and allow *all* disease to enter into consideration each time that we are called to a bedside is foolish in the attempt, and impossible in the performance. Each case should lead us to arrange before the mind's eye a selected group of reasonably probable causes for the symptoms complained of and for the signs discovered. What we select should depend upon the clues furnished us by the patient himself, or by the results of our own examination.

"When, for example, a patient pronounces the word '*headache*,' a group of causes should shoot into the field of attention like the figures on a cash register. Blue lips and finger-nails call up quite another group of ideas. Each clue or combination of clues should come to possess its own set of radiations or 'leadings,' determined partly by what we know of anatomy and physiology, partly by the hard knocks of clinical experience. . . .

"Why do so many practitioners treat symp-

toms only? Why are their diagnoses and the resulting treatment so full of vagueness, groping, hedging, and 'shot-gun' prescriptions?

"Because they do not know how to get beyond symptoms. They have not been taught from the point of view of practice—i.e., of the presenting symptom. What are the *possible* causes and linkages of any symptom? Which of them are most *probable*? By what methods of questioning or of examination can the *actual* cause be found? . . .

". . . Differential diagnosis [is] a very dangerous topic—dangerous to the reputation of physicians for wisdom. It is, I suppose, owing to this danger that so little has been written on differential diagnosis and so much on *diagnosis* (non-differential). To state the symptoms of typhoid perforation is not difficult. To give a set of rules whereby the conditions which simulate typhoid perforation may be excluded is exceedingly difficult. Physicians are very naturally reticent on such matters, slow to commit their thoughts to paper, and very suspicious of any attempt to tabulate their methods of reasoning.

"Yet all diagnosis must become differential before it can be of any use. All recognition of a lesion or a disease involves distinguishing possible sources of error and excluding them by a reasoning process—more or less definite and conscious. To be of any value, then, diagnosis must descend into the arena where it is questioned and assailed, where all sorts of errors and uncertainties arise to unsettle our wisdom. Those differential tables which we all distrust so much are really no more untrustworthy than the diagnoses we make in practice—for every diagnosis expresses the results obtained by using such a table more or less unconsciously, as we exclude possible errors and alternative diagnoses.

"The attempt to make and defend a differential diagnosis brings all one's failings into sharp relief."

From the introduction and preface to Richard C. Cabot's book, *Differential Diagnosis*, written in 1912.—O.R.C.

Clinicopathological Conference

Fever With Progressive, Fatal Coma

CASE PRESENTATION

The case under consideration today is that of a 62-year-old colored male who was admitted to the University of Kansas Medical Center on September 22, 1955, and who expired 30 hours later on September 23, 1955.

The patient was comatose on admission, and the history was obtained from members of his family. During the preceding five years he had been under treatment for hypertension, and for several years he had had a chronic cough which had become worse during the two weeks preceding his admission. Two days before admission he consulted his physician because of double vision and dizziness. At that time his temperature and urinalysis were normal, but the blood pressure was said to be high.

The patient fell out of bed the night before he was admitted to this hospital. He was too weak to return to bed himself, but after being helped back he was rational and talkative. At that time it was found that he was unable to move his right arm and leg. He apparently fell out of bed again the next morning, as he was found in coma on the floor. He was then rushed to this hospital.

The patient had had typhoid fever at 44 years of age. He had had syphilis at age 57 and was treated with penicillin at that time. Sugar had frequently been found in the urine, but the patient refused to go on a diet.

The family history and system review were non-contributory.

On physical examination the patient was found to be an obese colored man who was comatose and who responded only slightly to painful stimuli. The blood pressure was 200/120; pulse 128 and regular; temperature 106.2 degrees rectally; and the respiratory rate was 30. Enlarged painful preauricular lymph nodes were present. The pupils were round and equal and reacted to light. There was focal retinal arteriolar spasm but no papilledema. The neck was somewhat stiff. The chest was clear to auscultation and percussion. It was thought that the heart was enlarged on percussion. The second aortic sound was louder than

the second pulmonic sound. There was a grade II systolic murmur present at the apex; it was not transmitted.

The abdomen was soft and obese, and no masses were palpable. The peripheral pulses were good. The genitalia were normal, and the prostate was small and firm. The cranial nerves were intact with the exception of a right central seventh nerve weakness. There was a flaccid paralysis of the right arm and both legs. The left arm was spastic and was held in flexion. Fine clonic movements were visible in the left hand and the left side of the face. The deep tendon reflexes were sluggish in the arms and absent in the legs. There was no clonus, and Hoffman and Babinski signs were absent.

The admission urine had a specific gravity of 1.016, 3 plus albumin, negative sugar, and 8 to 10 pus cells per high power field. There were many hyaline, granular, and bacterial casts in each high power field. The red count was 4,750,000 with 11.2 gm. per cent of hemoglobin. The white count was 17,400 with 85 per cent neutrophils (72 per cent filamented and 13 per cent non-filamented), 11 per cent lymphocytes, 1 per cent basophil, and 3 per cent monocytes. The serologic tests for syphilis were negative. The serum non-protein nitrogen was 55.5 mg. per cent; urea nitrogen, 28 mg. per cent; fasting blood sugar, 175 mg. per cent; cholesterol, 294 mg. per cent; sodium was 133 mEq/L, potassium, 3.3 mEq.; chloride, 94 mEq. and carbon dioxide, 24.4 mEq. Serum amylase was 262 Somogyi units per cent, and serum lipase was 2.0 units per ml.

A lumbar puncture was done; the opening pressure was 170 mm. and the closing pressure 110 mm. There were 78 white blood cells (86 per cent lymphocytes) per cubic millimeter; the sugar was 140 mg. per cent; the chloride, 775 mg. per cent; and the total protein, 42 mg. per cent. The colloidal gold curve was 0111000000. The spinal tap was repeated on the following day with an opening pressure of 280 mm. and a closing pressure of 240 mm. There were 90 white blood cells (82 per cent lymphocytes and 18 per cent polymorphonuclear) and 4 red blood cells per cubic milliliter.

Throughout his hospital stay the patient was comatose except for a few moments when he opened his eyes and spoke briefly. Attempts were made to reduce the high fever with alcohol sponge baths and rectal aspirin, but these were unsuccessful except for two

Edited by Jesse D. Rising, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, pediatrics, surgery, radiology, and pathology of the University of Kansas Medical Center as well as by the third and fourth year classes of medical students.

brief occasions when rectal temperature was lowered to 102 degrees. He was treated with 2,000,000 units of aqueous penicillin intramuscularly every six hours and 1.0 gm. of chloromycetin by mouth every 12 hours. He received 200 mg. of cortisone intramuscularly two hours before he died. He was given intravenous fluids for hydration. His urinary output on the day of admission was 800 ml.; it was 500 ml. on the day of death.

Approximately 30 hours after he entered the hospital the patient's respirations became labored, and he died rather suddenly.

Dr. Hugh J. Woods (resident in medicine): I have one addition to the history: it was observed that the patient's preauricular nodes became much larger during his hospital stay, and some observers thought that these were actually the parotid glands.

Dr. Mahlon Delp (moderator): Are there any questions of Dr. Woods?

Kernie Binyon (fourth year medical student):* What was this patient like before he became ill?

Dr. Woods: We know nothing about him except that he was once seen in the outpatient clinic in March, 1955, at which time he complained of pain in his right shoulder. His tendon reflexes were a little hyperactive, and the possibility of his having tabes was mentioned.

Dwight Adams (fourth year medical student): Was a serology done on him?

Dr. Woods: It was negative.

Mr. Adams: What about the urinalysis?

Dr. Woods: There was a slight trace of albumin, no sugar, and rare epithelial and pus cells.

Donald Decker (fourth year medical student): Were there any blood cultures?

Dr. Woods: No.

Mr. Decker: Was there anything unusual about his testicles?

Dr. Woods: No.

Question: Could you give us any more information on the second spinal tap?

Dr. Woods: The fluid was clear, the protein was 52, sugar was 112, and a culture was negative at 72 hours.

Question: Did he have hyperpyrexia during the terminal episode?

Dr. Woods: No, his temperature was about 102 degrees an hour before his death. The medical student said he suddenly stopped breathing, and his heart beat about eight or ten times after that.

Question: Had he lived in Kansas City all of his life?

Dr. Woods: Yes.

Question: Did he have a history of mumps?

Dr. Woods: The history was not clear, but the relatives thought he had never had mumps.

Question: Was only one fasting blood sugar run?

Dr. Woods: Yes.

Question: Was he receiving glucose at that time?

Dr. Woods: No.

Question: Did he have otitis media?

Dr. Woods: No.

Mr. Decker: Would you describe the convulsive movements more clearly?

Dr. Woods: They were intermittent twitching movements of the hands and left side of the face.

Question: Was he in a light or a deep coma most of the time?

Dr. Woods: It was deep.

Dr. Robert Weber (internist): What was his blood pressure during the 30 hours of hospitalization?

Dr. Woods: The systolic pressure was 170 to 200 and the diastolic was 100 to 105 millimeters of mercury.

Dr. Weber: Did it drop at all in the final six hours?

Dr. Woods: Two or three hours before he died his pressure was 180/100.

Dr. Delp: What was his blood pressure when he was in the outpatient clinic in March?

Dr. Woods: It was 230/128.

Dr. Delp: Mr. Boese, will you please present the electrocardiograms?

Kenneth Boese (fourth year medical student): The first electrocardiogram (Figure 1) was taken when the patient was seen in the outpatient clinic in March, 1955, and shows a normal sinus rhythm with a rate of approximately 80. The PQ interval is within normal limits. There is a tall R wave of two and one-half centimeters, and there are inverted T waves in leads I, AVL, V3, V4, V5 and V6. The QRS interval is approximately .08 of a second. This electrocardiogram

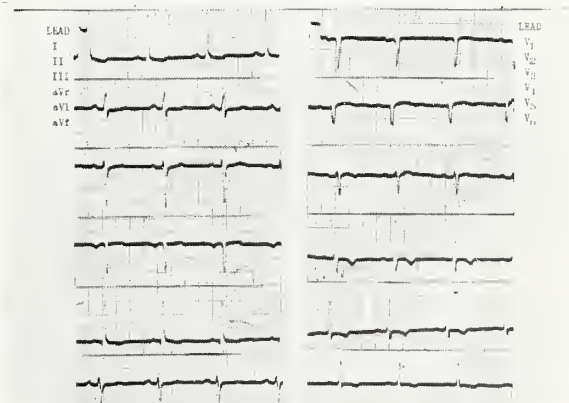
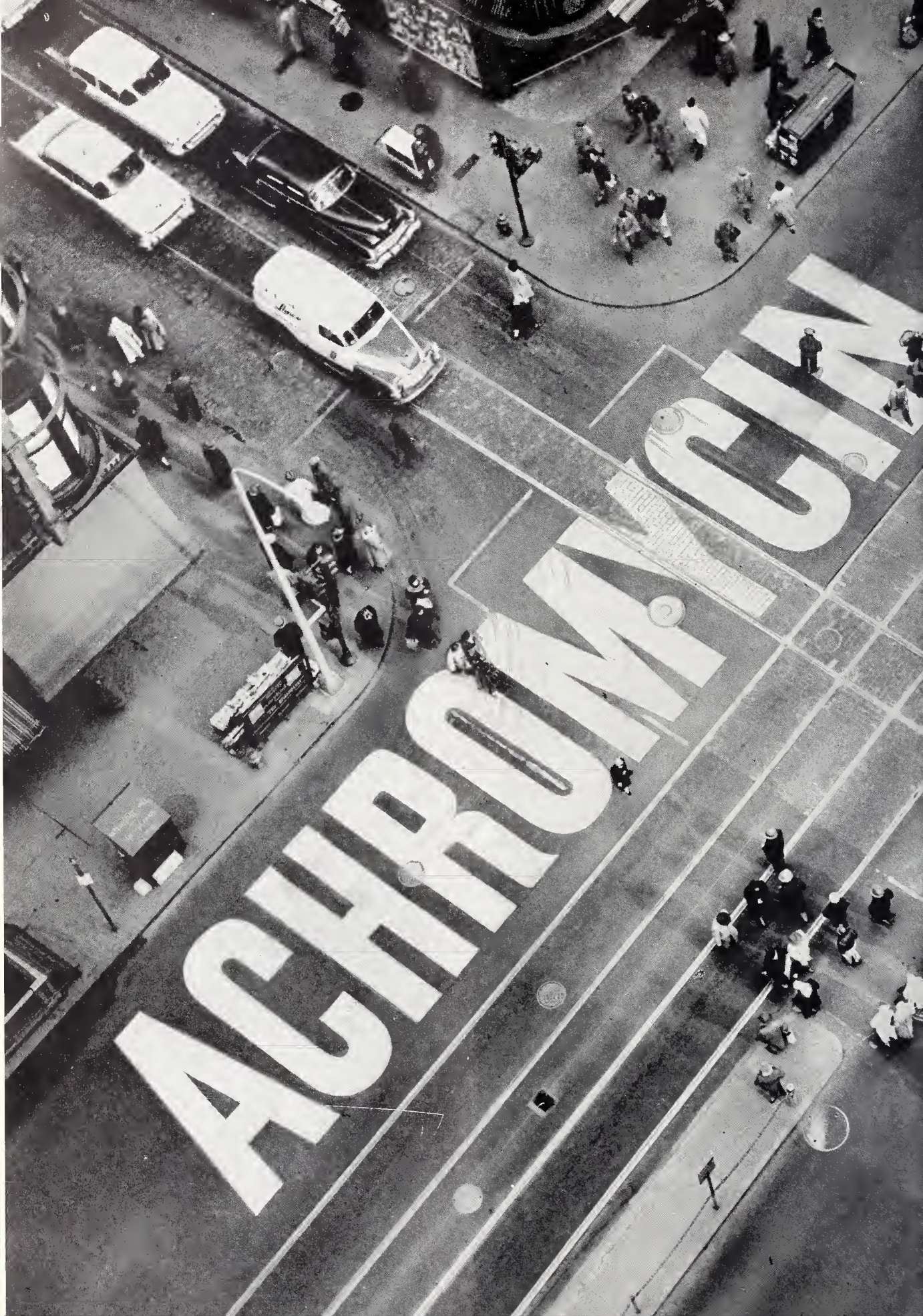


Figure 1

*Though a medical student in March, 1956, when this conference occurred, he, like the others referred to as students, received the M.D. degree in June, 1956.





ACHROMYCIN*

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¹Posner, A. C., *et al.*; Further Observations on the Use of Tetracycline Hydrochloride in Prophylaxis and Treatment of Obstetric Infections, *Antibiotics Annual* 1954-55, pp. 594-598.



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PHOTO DATA: SPEED GRAPHIC CAMERA,
F.16, 1/50 SEC., ROYAL PAN FILM

shows the pattern of left ventricular hypertrophy, strain, and ischemia.

The second electrocardiogram (Figure 2) was taken the day after admission. The rate is 120. The T waves are inverted in leads I and AVL. The chest leads have reverted back to normal. This tracing shows left ventricular hypertrophy and strain, but there is no ischemia pattern that I can see.

Dr. Delp: Dr. Lin, do you have any comments about the electrocardiograms?

Dr. T. K. Lin (cardiologist): The first tracing showed an interesting sequence from leads four and five, particularly the inverted T waves, which indicated a rather localized ischemia. I saw no definite evidence of left ventricular hypertrophy in spite of the clinical hypertension.

The second tracing showed a sinus tachycardia and a possible ischemic pattern in lead I, but no evidence of ventricular hypertrophy.

Dr. Delp: Mr. Elliott, will you demonstrate the x-rays?

Wade Elliott (fourth year medical student): A shoulder film taken six months before admission shows no bony abnormalities or calcifications in the soft tissues. I interpret this as a normal shoulder.

The cervical spine was x-rayed at that time, and it shows some increased density and lipping of the fifth cervical vertebra and possibly narrowing of the joint space. This could be the result of an old fracture, but it is more likely an osteoarthritic process.

A portable film of the skull taken at the time of admission shows clear frontal sinuses. There is no marked sclerosis of the mastoid process. I interpret this as being a normal skull.

The portable chest film taken on admission, with the patient in some rotation, shows no bony abnormalities and no pathology in the lung fields. I cannot decide about the heart size on the basis of this

portable film. The appearance of a mediastinal widening is probably due to rotation. There is a deviation of the trachea which I cannot explain.

Dr. Delp: Are there any comments, Dr. Germann?

Dr. Donald R. Germann (radiologist): The enlargement of the mediastinum and the tracheal deviation are probably caused by a moderately wide aorta, but I doubt if there is significant tracheal deviation. There is a little left ventricular prominence to the cardiac contour. There is rather marked joint space narrowing of the cervical spine with osteoarthritic spurring around it. It is a degenerative process probably of no importance so far as this admission is concerned.

Dr. Delp: Will you present the differential diagnosis, Mr. Decker?

DIFFERENTIAL DIAGNOSIS

Mr. Decker: We are discussing a 62-year-old man who was admitted to the hospital with the chief complaint of a possible stroke, and who died 30 hours later. There is a history of hypertension and glycosuria. Two days before admission the patient developed double vision and dizziness. He became weak, hemiplegic, and comatose. The physical examination on admission revealed deep coma, hypertension, tachycardia, hyperpyrexia, bilaterally enlarged preauricular lymph nodes or parotid glands, nuchal rigidity, and diffuse neurological signs without papilledema.

The laboratory examinations showed evidence of kidney dysfunction, leukocytosis, elevated serum amylase and lipase, and cerebrospinal fluid abnormalities including an increased cell count (chiefly lymphocytes) and increased pressure. Despite vigorous treatment with antibiotics and cortisone, the patient remained comatose and died 30 hours later.

My differential diagnosis is based on the causes of coma. First, the endogenous and exogenous causes of coma can be quickly ruled out on the basis of laboratory findings, the hospital course, and the clinical findings. Traumatic causes of coma, such as cerebral concussion, cerebral contusion, and acute epidural hematoma can be excluded because there was no history of injury. Subdural hematoma is more difficult to rule out on this basis, but, because of the high fever and equal pupils, I do not think it is the most likely diagnosis.

Cerebral ischemia, such as can be produced by Stokes-Adams attacks and hypertensive encephalopathies, should be mentioned as occasional causes of coma, but we must look elsewhere to explain all the findings that we have in this case.

Primary or metastatic intracranial tumors characteristically present with symptoms of increased intracranial pressure including dizziness, visual signs, vomit-

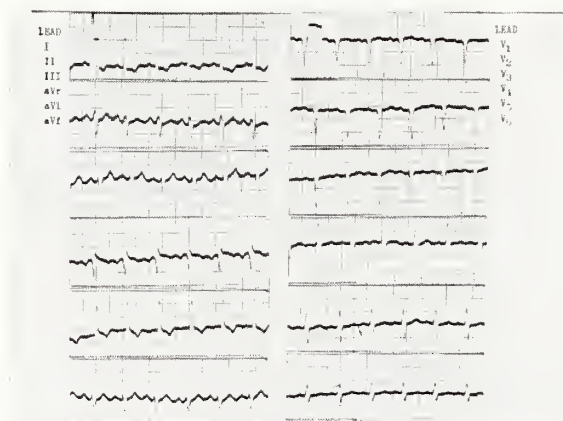


Figure 2

ing, and severe progressive headache, and the onset can be sudden if hemorrhage occurs into the tumor. Adults frequently present with focal convulsions or other focal signs. The cerebrospinal fluid protein is frequently increased. This case does not fit any of the well outlined clinical tumor syndromes, but one must consider other more diffuse syndromes.

Cerebral vascular accidents must be considered as a cause of coma. Cerebral thrombosis is the most common form of cerebral vascular accident, but consciousness is rarely lost, the patient usually recovers, the cerebrospinal fluid is usually normal, and there is commonly evidence of a local, unilateral lesion. I cannot localize a thrombus which would produce the widespread signs this patient had. Cerebral embolism can be ruled out on the same basis, and there is no logical site for the origin of an embolus.

Subarachnoid hemorrhage usually occurs in younger persons and can be easily ruled out because there was no blood in the cerebrospinal fluid.

Cerebral hemorrhage must be considered because of the patient's hypertension. Characteristically there is sudden onset, coma supervenes, and these patients usually die. There is often a progressive rise in temperature and pulse rate. The cerebrospinal fluid may be under increased pressure, and there may be increased protein and pleocytosis. In about 50 per cent of such patients the cerebrospinal fluid is bloody, but that is not diagnostic. Bleeding into a ventricle can also produce hyperpyrexia. I ruled out cerebral hemorrhage because I cannot localize a vascular lesion which would produce such widespread bilateral neurological deficit without producing more cranial nerve signs.

Bilateral carotid artery thrombosis usually occurs in patients who have a history compatible with thrombosis of one side. Blindness is frequently produced, and the cerebrospinal fluid is normal. The high fever in this case speaks against this.

Cerebral venous lesions such as lateral sinus thrombosis and superior sagittal sinus thrombosis must also be considered. They are preceded by a bacterial infection such as mastoiditis or paranasal sinusitis, but the infection may not be recognized. Typically there is a septic fever rather than a sustained high fever such as this patient had.

The septic causes of coma must be strongly considered in this patient. The bacterial meningitides can quickly be ruled out on the basis of cerebrospinal fluid findings. They produce a greatly increased polymorphonuclear count and depress the glucose, and the organism can usually be cultured from the cerebrospinal fluid. Brain abscess usually has a slow onset. The degree of pyrexia that this patient had would be unusual unless the abscess ruptured into the subarach-

noid space or into the ventricles. I do not think that this is the most likely diagnosis.

Central nervous system syphilis and syphilitic gummas can be ruled out on the basis of the negative serology.

The mycotic encephalitides characteristically produce a chronic illness and cerebrospinal fluid findings which are not like those in this case. They elevate protein and depress the sugar.

The rickettsial encephalitides are nearly always accompanied by a skin rash, and they are very rare.

All of the findings in this case are compatible with a viral meningo-encephalitis. St. Louis encephalitis may have a sudden onset with diffuse cerebral and meningeal signs, acute rise in temperature up to 106 degrees, progressive coma, and a mild pleocytosis, especially of the mononuclear cells. The rest of the cerebrospinal fluid findings are compatible with St. Louis encephalitis. Convulsions may occur and mortality is high, particularly in the older age groups. Western and eastern equine encephalitis are capable of producing this same clinical picture, but they are rare in this region.

The possibility of mumps encephalitis should not be dismissed lightly, although it is uncommon in this age group, and fatal cases are extremely rare. Donahue¹ reported 20 proved cases. The bilateral preauricular swellings might have been the parotid glands, and the elevated serum lipase and amylase would be compatible with mumps.

One should mention other secondary meningo-encephalitides such as those caused by measles and mononucleosis, but they are rare in this age group.

In summary, the best diagnosis in this case is viral meningo-encephalitis. I would only be speculating to pin it down to any particular etiological agent. I cannot, with certainty, rule out cerebral hemorrhage, hemorrhage into a brain abscess, hemorrhage into a brain tumor, or bilateral carotid artery thrombosis.

CLINICAL DISCUSSION

Dr. Delp: What is your final diagnosis?

Mr. Decker: Meningo-encephalitis, probably viral. If I had to pin it down, I would say St. Louis encephalitis.

Dr. Delp: Mr. Binyon, did you rule out mumps?

Mr. Binyon: Not entirely.

Dr. Delp: Do you think that it probably was mumps?

Mr. Binyon: My diagnosis is a meningo-encephalitis of viral etiology. I do not know whether or not it was mumps.

Dr. Delp: Mr. Deosaransingh?

Manohar Deosaransingh (fourth year medical student): I think that he had meningo-encephalitis,

but I do not know the cause. It is more or less an arbitrary diagnosis, and I doubt very much whether the pathologists can get any closer to the etiology than we can.

Dr. Delp: Mr. Doubek, did you rule out a vascular lesion, and if so, how?

Herbert Doubek (fourth year medical student): I did not. The onset with the patient falling out of bed goes along with a vascular accident and progressive coma, but I think that the spinal fluid findings are against it.

Dr. Delp: Mr. Elliott?

Mr. Elliott: I agree with the diagnosis of viral meningo-encephalitis, but I am a bit disturbed by the sugar falling in the second spinal tap. I do not expect the sugar to go down in the spinal fluid without a correlated blood sugar fall.

Dr. Delp: Mr. Decker, how did you deal with that problem?

Mr. Decker: I did not deal with it.

Dr. Delp: How would you explain the patient's fasting blood sugar of 175 mg. per cent?

Mr. Decker: I think he had diabetes mellitus.

Dr. Delp: Do you think that this contributed to his death?

Mr. Decker: I think that he would have died anyway.

Dr. Delp: Dr. Berry, there have been frequent references here to St. Louis encephalitis. I want to call on someone who lived through the epidemic of Kansas City encephalitis. Do you think that this picture at all simulates your experience with patients in that epidemic?

Dr. Maxwell G. Berry (internist): Equine encephalitis is a possibility if this family lived outside the city limits or close to a reservoir of some kind. As most of you know, the main reservoir in rural Kansas and Missouri is the horses. The onset in September suggests that he may have been bitten by a mosquito. The encephalitis that I have seen in Kansas City itself has been sporadic cases of an encephalitis which is caused by an unknown virus.

A year ago I saw a few patients in Colby who had equine encephalitis. The reservoir was right there in a horse barn. The mosquitoes were in the backyard, and they were Anopheles, too. We had a little trouble getting the public health service to work on it, but when they did they traced it down very well. To make a diagnosis of encephalitis in this patient, we have to overlook a lot of things. You have more red herrings in this protocol than any I have seen for a long time, i.e. the long history of hypertension, the hyperglycemia, and a colored man with a chronic cough. These situations are quite suggestive of widely different diagnoses. Those things are a little bit difficult to overlook. If he did have encephalitis, it would have been

more convincingly suggested by his living in the outskirts of town where mosquitoes are more plentiful.

Dr. Delp: Dr. Weber, what was your diagnosis?

Dr. Weber: I saw this patient, and I made the diagnosis of mumps meningo-encephalitis.

Dr. Delp: You thought the man had parotitis?

Dr. Weber: Yes, and I thought that the blood sugar might have been related to pancreatitis.

Dr. Delp: Do you think the amylase values are compatible with that?

Dr. Weber: They are not high enough for an acute pancreatitis.

Dr. Delp: Did he have any abdominal tenderness when you examined him?

Dr. Weber: I could not elicit anything, but it was two or three hours before he expired.

Dr. Delp: I doubt if he had any abdominal tenderness. I did not examine him personally, but I watched several others examine him.

PATHOLOGICAL REPORT

Dr. Frank A. Mantz (pathologist): External examination of the body disclosed that the individual was moderately obese, and there was bilateral enlargement and swelling in the preauricular area.

The parotid glands were enlarged, exceedingly soft, and of a distinct yellow color. They show the picture of fat replacement which is not uncommon in people who are obese and in older persons. Similar fat replacement was found in the pancreas. No evidence of inflammation was found in the gland.

A general systemic examination yielded little of particular note. There were few, if any, stigmata of diabetes. A mild degree of arteriosclerosis was detected.

The heart weighed 680 grams and showed marked left ventricular enlargement. No valvular lesions were detected, and the coronary vessels were patent throughout. The kidneys, although not significantly con-

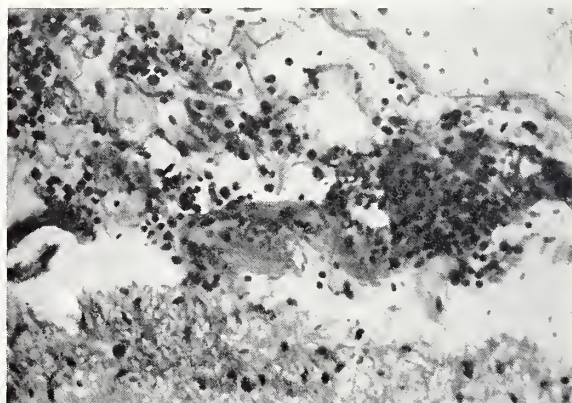


Figure 3. Right parietal leptomeninges showing inflammation with edema and predominantly lymphocytic exudate.

tracted, showed fine granularity, and on microscopic examination there was a significant degree of arteriosclerosis associated with mild thickening of the basement membrane of the glomerular capillaries.

The gross examination of the brain showed no defect. The brain weighed 1340 grams, was not significantly hyperemic, and showed no evidence of increased intracranial pressure; on section no discrete lesions were encountered. Histologically, however, characteristic findings were noted. There was a diffuse mild meningitis manifested here by thickening and edema of the meninges and by a moderate infiltration of leukocytes, mostly lymphocytes (Figure 3). The meningitis was rather patchy in distribution. It was seen most intensely over the frontal and parietal regions and to a lesser degree over the base. No meningitis was detected over the cerebellum, about the brain stem, or about the cervical cord. The ependyma was not involved, and there was no infiltration in the choroid plexus.

The next characteristic lesion was in the neuron, which displayed a moderate degree of what might be classified as acute cell disease. This is manifested here by loss of Nissl's substance, swelling and smudginess of the nuclei (chromatolysis), and moderate satellitosis by glial cells adjacent to the neurons (Fig-

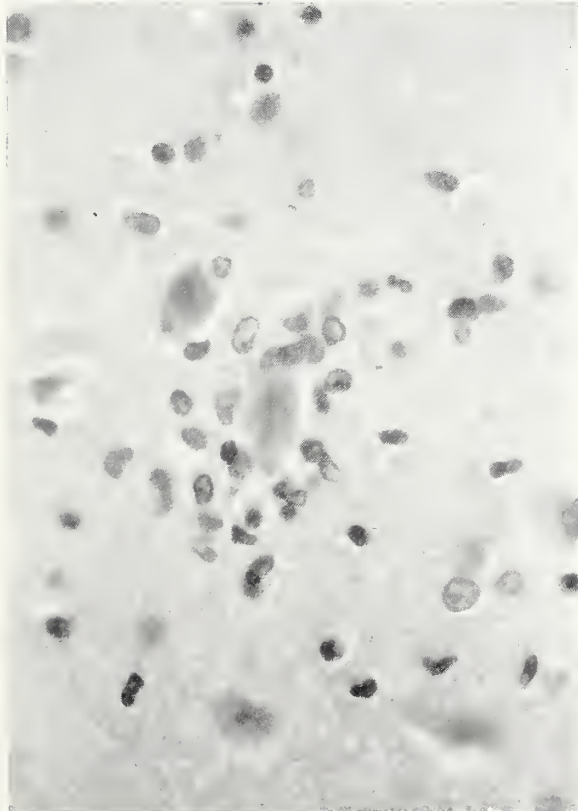


Figure 4. Right parietal cortex showing neuronal necrosis and satellitosis.

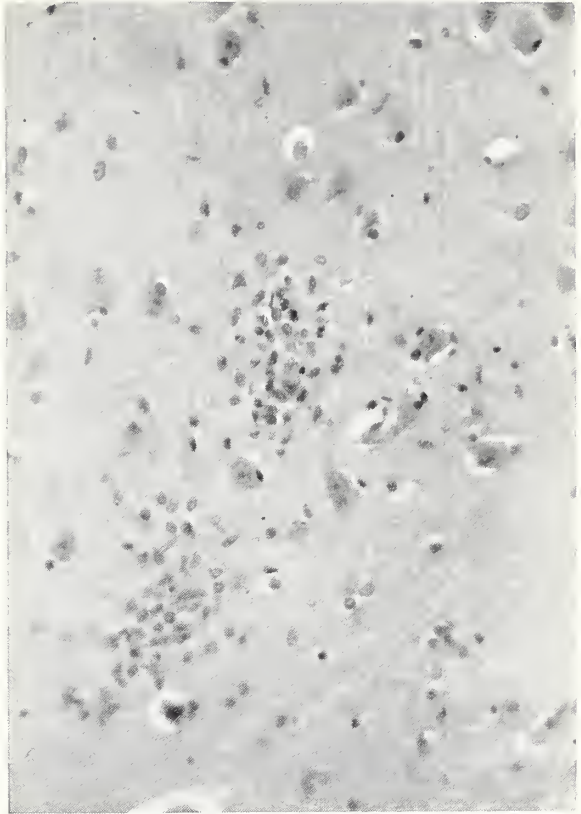


Figure 5. Hippocampal gray matter showing microglial nodules.

ure 4). In some areas frank necroses of the neurons had occurred, producing tiny glial reaction sites. In the cortex there were, in addition, clusters of glial elements, mostly microglia, unassociated with degenerating neurons, following the tiny capillaries (Figure 5). These tiny glial nodules were the most frequently encountered and probably the most significant change in the brain substance.

A third and striking lesion that was present throughout the brain was perivascular cuffing with lymphocytes in which the Virchow's space about the blood vessels was literally stuffed with lymphocytes (Figure 6). Changes within the brain were mainly within the basal ganglia, the midbrain, the pons, and the medulla.

A section from the caudate nucleus showed what might be classified as a fourth type of lesion, that of focal parenchymal degeneration unassociated with significant neuronal damage (Figure 7). In such sites there is some evidence of demyelination, but characteristic perivascular demyelination is not seen in this case. The cells which compose the reaction here are largely microglia. The globus pallidus was similarly involved. In fibers which traverse the internal capsule one encounters occasional small lesions accounting

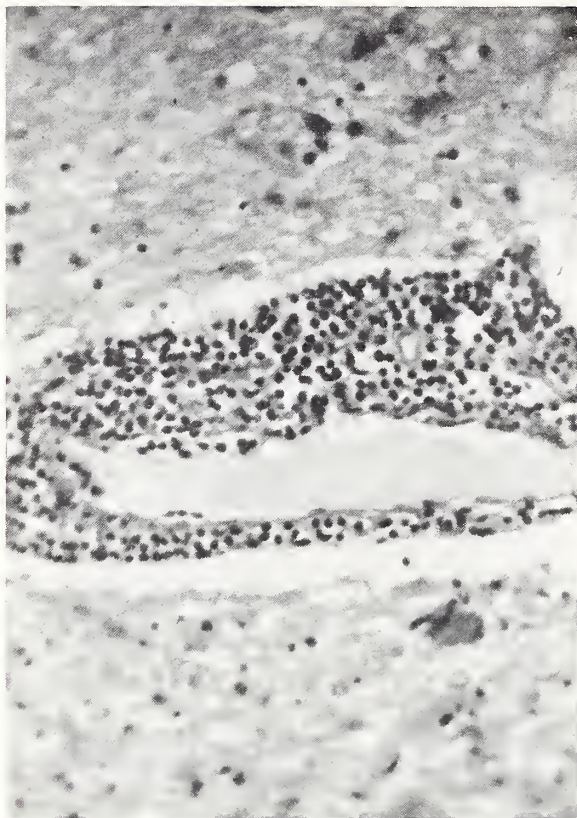


Figure 6. Midbrain in region of substantia nigra showing marked perivascular lymphocytic infiltrate in Virchow Robins space.

for whatever upper motor neuron changes this patient may have had.

The most marked changes were encountered within the substantia nigra which bilaterally was diffusely involved with wide areas of parenchymal degenerative changes. The brain stem likewise was affected, the involvement extending throughout the reticular substance.

These findings are classical of a viral type encephalitis. There is diffuse distribution throughout the brain substance, which suggests that this was an encephalitis that had been blood-borne. The absence of involvement of the ependyma suggests that lymphocytic chorio-meningitis is not a factor here. Our failure to demonstrate intracellular inclusions excludes rabies, herpes simplex, and inclusion encephalitis. This probably belongs to a large group of insect-borne viral diseases which include Japanese B encephalitis, Australian X, California, and a number of other somewhat esoteric diseases which can be excluded on the basis of geography. That leaves us with St. Louis encephalitis, eastern equine encephalitis, and western equine encephalitis. Mumps encephalitis cannot absolutely be ruled out, but one would expect to find considerably more perivascular demyelination than

one sees here. The pathologist finds himself at an impasse and must enlist the aid of a virologist to determine the definitive diagnosis. For this reason I would like to ask Dr. Werder to relate to you the studies that he conducted on material which we gave him.

Dr. Alvar A. Werder (microbiologist): When we think of the eastern and western equine viruses, we should remember something about where they can be found and what their natural hosts appear to be. We have known for about 20 or 25 years that they can be pathogenic for man. St. Louis encephalitis has been common in this area as well as in St. Louis. Western equine, as the name implies, is common in the western part of the country, but it is spreading eastward all the time. Eastern equine encephalitis is mainly found in the eastern part of the country, but it has also appeared in Texas and Arkansas and is moving westward. It has not been reported in Kansas.

We no longer believe that the horse is the natural host. Chickens, pigeons, wild fowl, and some wild animals are now thought to be the natural host. The virus is spread accidentally by bite of either *Anopheles* or *Culex* mosquitoes, mites, or ticks to horses, mules, and human beings.

It was surprising to us that we did find evidence

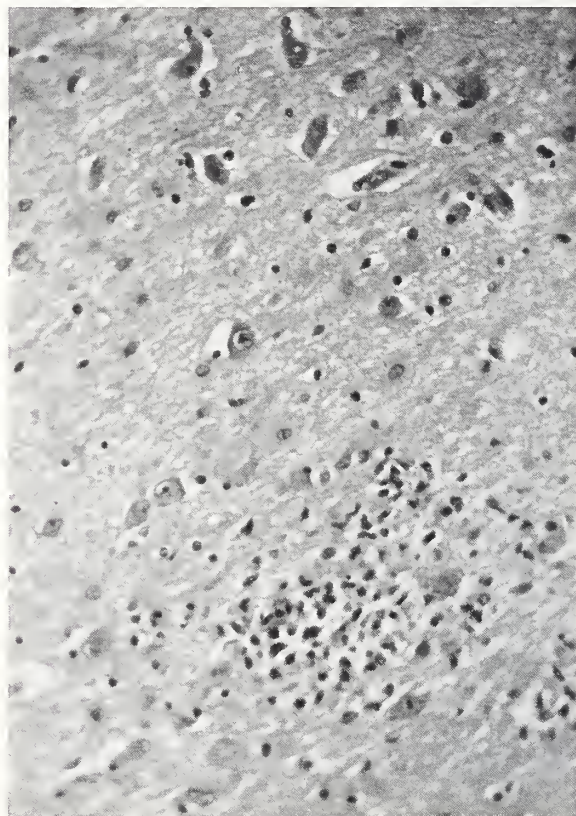


Figure 7. Caudate nucleus showing focal parenchymal degeneration with mild glial reaction.

that pointed to eastern equine encephalitis virus. We inoculated brain tissue into young mice. It caused an illness characterized by ruffled fur, hunching of the back, paralysis, and death. This could be neutralized by the addition of serum from patients who had convalesced from eastern equine encephalitis, but it was not neutralized by serum from patients who had had St. Louis or western equine encephalitis. This evidence points strongly to the fact that our patient had eastern equine encephalitis.

Dr. Delp: Thank you, Dr. Mantz and Dr. Werder. Once more we have a case at this session in which death was due to an infectious process, something I always like to emphasize. I was not being facetious when I mentioned Kansas City encephalitis. There was an epidemic of encephalitis in St. Louis and Kansas City in 1933, 1934, and 1935. Although St. Louis received most of the publicity, and the virus has been named after that city, some investigators have felt that there was a subtle difference between the two epidemics and have occasionally referred to the epidemic here as Kansas City encephalitis. I would not have guessed that this was eastern equine encephalitis because my own impression has been that it usually occurs in children, seldom in adults. Western equine encephalitis is essentially a disease of adults.

PATHOLOGICAL ANATOMICAL DIAGNOSIS

Primary

Eastern equine encephalitis, advanced (history of diplopia, fever, and coma developing progressively over three days prior to death and post mortem isolation of the virus with identification through neutralization tests).

Puncture wounds in the lumbar region of the back (history of spinal punctures revealing increased cerebrospinal fluid pressure, 90 leukocytes per cubic millimeter with 82 per cent lymphocytes, total protein 52 mgm. per cent, sugar 140 mgm. per cent, and chloride 775 mgm. per cent).

Hyperplasia of bone marrow, moderate (history of leukocytosis, 17,400 per cubic millimeter with 82 per cent polymorphonuclear neutrophil leukocytes).

Depletion of cortical lipid of adrenal glands.

Fatty metamorphosis of the liver, slight.

Accessory

Arteriosclerosis of the aorta and coronary arteries, moderate, and of the cerebral, pulmonary and celiac arteries, slight.

Hypertrophy and dilatation of the heart, 620 gm. (history of hypertension with blood pressure 230/130 for undetermined period).

Arterio and arteriolonephrosclerosis, slight.

Emphysema of both lungs, slight.

Calcified nodule, tracheobronchial lymph node.

Obesity, moderate, weight 215 pounds.

Fat replacement of the parotid glands, advanced.

Fat infiltration of the myocardium and pancreas, slight.

Small submucosal neurofibroma of the ileum.

Small hemangioma of the liver.

Focal calcification of renal tubules, slight.

Small retention cyst of both kidneys, slight.

Nodular hyperplasia of the prostate, slight.

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PHYSICIANS' ACTIVITIES

Dr. Jerome S. Menaker, Wichita, was invited to serve as a speaker at a meeting of the American Academy of Obstetrics and Gynecology in Chicago early this month.

Dr. David Robinson, professor of surgery at the University of Kansas School of Medicine, participated in a symposium on surgery of the eyelids at a meeting of the American College of Surgeons in San Francisco early last month. Later he conducted a course on surgery of irradiated tissue for the American Society of Plastic and Reconstructive Surgeons at Miami Beach.

Wyandotte County has made plans for providing a full time resident physician for the county home and hospital and has appointed **Dr. Lennert B. Mellott**, Bonner Springs, to that position.

"Skin Cancer" was the subject of an address given by **Dr. A. E. Hiebert**, Wichita, before a recent meeting of the Sedgwick County Chapter of the American Cancer Society.

Dr. LaVerne B. Spake, Kansas City, was notified recently that his portrait will be added to a collection of photographs of leaders in the medical profession in the armed forces medical library in Washington.

Dr. A. R. Cuadrado, Sharon Springs, has announced plans to open an office in Goodland and practice there four half-days a week while continuing to practice in Sharon Springs the remainder of the time.

Dr. Rodger A. Moon and **Dr. C. Arden Miller**, of the University of Kansas Medical Center, presented a case of psychiatric disturbance in a preschool child at the annual meeting of the Kansas Council for Children and Youth in Emporia last month.

A three-year residency in anesthesiology at the Mayo Clinic, Rochester, has been begun by **Dr. Bernard A. Brungardt**, Salina.

Dr. Robert G. Loudon of Edinburgh, Scotland, who recently completed a course in pulmonary diseases at Brompton Hospital, London, arrived in Kansas last month to join the medical staff of the new Southeast Kansas Tuberculosis Hospital in Chanute.

Dr. Howard E. Snyder, Winfield, was nominated as a member of the board of the American Cancer Society at a meeting of Region 7 at Little Rock recently. **Dr. J. P. Berger**, Wichita, was elected chairman of Region 7, which includes Arkansas, Kansas, Missouri, Oklahoma, and Texas.

Dr. William L. Valk, of the University of Kansas Medical Center, is serving as a member of the A.M.A. Residency Review Committee. He has inspected residency facilities in California and Louisiana.

Dr. Robert E. Bolinger, associate professor of medicine at the University of Kansas School of Medicine, is on sabbatical leave, August 1, 1956, to July 1, 1957, to study insulin and metabolic diseases in Holland. The greater part of the time will be spent at the University of Amsterdam.

Dr. D. V. Conwell, Wichita, has been appointed a member of the Committee on Preliminary Arrangements for the second Pan-American Congress of Gerontology, to be held in 1958.

Dr. Donald L. Rose, Kansas City, was named president-elect of the American Congress of Physical Medicine and Rehabilitation at a meeting held at Atlantic City in September.

Dr. Victor E. Chesky, Halstead, became a fellow of the International College of Surgeons at a meeting held in Chicago last month.

Dr. J. O. Osborne, formerly of Prairie Village and Kansas City, has opened an office in Eudora.

Dr. William J. Reals, Wichita, is one of three authors of an article, "Determination of Protein-Bound Iodine by the Leffler Method," published in the September issue of *U. S. Armed Forces Medical Journal*.

"So You Have an Allergy" was the subject of a talk given by **Dr. Harry Lazar**, Wichita, before a recent meeting of the Sedgwick County Medical Assistants' Society.

A retired physician, **Dr. Jacob H. Enns**, Newton, has enrolled as a non-credit student in the University of Wichita's first political science telecourse. Dr. Enns will observe the 50th anniversary of his graduation from Fairmount College, now the University of Wichita, next June.

Dr. Harold W. Houk, an Oklahoman who recently completed internship in Wichita, opened an office in Wellington on October 1.

A feature story about **Dr. Ralph R. Melton**, Marion, who has made a hobby of studying Kansas history, was published in a recent issue of the *Wichita Eagle*. With his family Dr. Melton has collected a vast amount of historical data which is being preserved in the Marion City Library and the Marion County courthouse.

Dr. R. E. Riederer, Olathe, addressed the Washington School Parent-Teacher Association there recently on the subject of the school health program.

Dr. H. Preston Palmer, Scott City, recently celebrated his 25th anniversary in practice there. A story about him was published in the *Scott City News Chronicle* at the time, telling of changes in medical practice during the 25-year period.

"Health Facts and Fallacies" was the subject discussed by **Dr. Christine Thelen**, Wichita, at a recent meeting of dental assistants in Wichita.

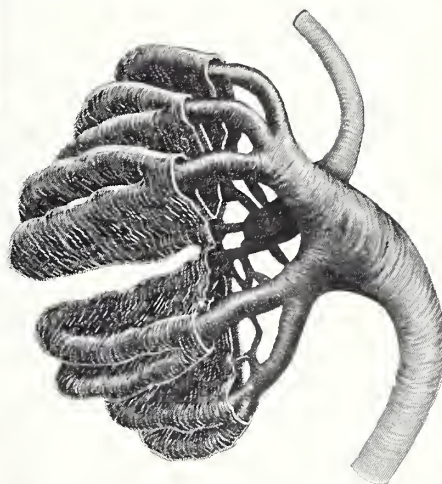
The establishment of the **Dr. F. D. Lose** and Ann Lose medical student loan fund at the University of Kansas School of Medicine has been announced. Dr. Lose, who was a member of the first graduating class of the school, has practiced in Madison for 50 years, and the community expressed its appreciation by contributing \$1,500 to the fund.

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SEARLE

Dr. Harold L. Graber, formerly of Hutchinson, has moved to California and has established his practice in Fullerton.

Dr. Jesse R. Pritchard, Fort Scott, has been named health officer of Bourbon County, replacing Dr. Ralph Y. Strohm who has resigned after 10 years of service.

A feature story about **Dr. Etta Mundell**, retired Hutchinson physician, was published in the *Hutchinson News-Herald* recently as part of the observance of National Businesswomen's Week.

Dr. Edward X. Crowley, Wichita, became a fellow of the American College of Surgeons at a meeting in San Francisco on October 12.

Dr. Edward J. Fitzgerald, formerly of Columbus, Nebraska, has moved to Wichita to become director of the department of radiology at Wichita-St. Joseph Hospital.

The Union Pacific Railroad has appointed **Dr. A. R. Cuadrado**, Sharon Springs, as its physician in the Sharon Springs area.

DEATH NOTICES

IONE SCHULTZ CLAYTON, M.D.

Dr. Ione S. Clayton, 71, an honorary member of the Cowley County Society since her retirement in 1953, died at her home in Arkansas City on September 16. She was graduated from the University of Illinois College of Medicine in 1908 and came to Kansas the following year, continuing in practice in Arkansas City until retirement. She had served locally as a member of the board of education and statewide as a member of the board of health.

SAMUEL GLICK ASHLEY, M.D.

Dr. S. G. Ashley, 74, who had practiced in Neosho County since 1908, died in Chanute on September 17, two weeks after suffering a cerebral hemorrhage. He was an active member of the Neosho County Society. He was a graduate of the University Medical College of Kansas City, class of 1908, and practiced first in Earlton, moving to Chanute in 1924. In recent years two sons, Dr. Ed Ashley and Dr. Glen Ashley, had been associated with him in practice at the Ashley Clinic.

ALBERT NEWTON GRAY, M.D.

An 86-year-old physician who remained active in practice until 10 days before his death on September 20 was Dr. Albert Newton Gray, Burlington. He had practiced in Burlington since 1917, having practiced first in central Kansas and Utah after his graduation from the University of Kansas School of Medicine

in 1907. At the time of his death he was an honorary member of the Coffey County Society, an organization he served as president. He was also health officer of Coffey County.

GEORGE WILLIAM BERTRAM BEVERLEY, M.D.

A veteran physician, Dr. G. W. B. Beverley, 84, died at his home in Topeka on September 24. He was an honorary member of the Shawnee County Society. Dr. Beverley received part of his education at the University of Bristol in England, receiving his degree from that school in 1897. He later studied at McGill University in Montreal, Canada, and received his medical degree from University Medical College of Kansas City in 1903. He began practice in Alma and left there to serve in the Army in World War I. He opened an office in Topeka when he returned from military service, and he remained in practice there until his retirement in 1942.

PERRY MARSHALL BELL, M.D.

A Wichita physician who had served as Sedgwick County physician for 26 years, Dr. P. M. Bell, 67, died at a Wichita hospital on October 3 after a short illness. He was graduated from Howard University College of Medicine, Washington, in 1914 and began practice in Wichita after internship in Washington and a residency in Kansas City, Missouri. He was an active member of the Sedgwick County Society.

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Dr. Donald L. Rose, Dr. Stanley F. Radzynski, and Dr. Ralph E. Beatty, of the University of Kansas School of Medicine, received the gold medal of the American Congress of Physical Medicine and Rehabilitation at the organization's September meeting in Atlantic City. It was awarded for their exhibit, "Effectiveness of Brief Maximal Exercise on the Strength of the Quadriceps Femoris."

COUNTY SOCIETIES

Members of the Shawnee County Society were hosts at a meeting of the Golden Belt Medical Society held at the Hotel Jayhawk, Topeka, on October 4. Dr. William Spanos of Kansas City spoke on "Toxemias of Pregnancy," and Dr. Derek Miller, Topeka, discussed "The Tranquilizing Drugs."

Dr. Arthur Grollman, chairman of the Department of Experimental Medicine, Southwestern Medical School, was guest speaker at a meeting of the Sedgwick County Society on October 2. He discussed "Endocrine Disorders in Everyday Practice."

A meeting of the Southeast Kansas Medical Society was held at the Columbus Country Club last month with members of the Cherokee County Society as hosts. Dr. Kenneth E. Cox, Kansas City, Missouri, was guest speaker. At the business session Dr. William T. Braun, Pittsburg, was named president, Dr. Raymond W. Lance of Arma was elected vice-president, and Dr. Dick B. McKee, Pittsburg, was chosen as secretary-treasurer.

Two speakers presented a program at a meeting of the Shawnee County Society held at Topeka on October 1. Mr. Otto Schnellbacher gave a review of the insurance program open to physicians, and Capt. C. P. Hungate, M.C., U.S.N.R., Olathe, spoke on "Problems in Management of Atomic Blast Injuries." At the business session Dr. Harry J. Davis was elected to honorary status and the following were elected to active status: Doctors Lawrence M. Agan, M. Kirk Miller, Jr., Charles F. Pierce, William R. Powell, Oscar S. Proctor, and Bartlett W. Ramsey, all of Topeka.

A meeting of the Wyandotte County Society was held at Kansas City on October 16. Two guests, Mr. David Morantz and Mr. Claude E. Housman, discussed "The Problem of Collecting Delinquent Accounts in Medical Offices."

A program on thyroid diseases was presented at the September meeting of the Riley County Society held in Manhattan. Speakers were Dr. Albert E. Upsher, pathologist; Dr. Ward Wilhelm, internist, and Dr. Sam Chapman, radiologist, all of Kansas City.

Surgeons Elect Officers

Officers for the coming year were elected by the Kansas Chapter of the American College of Surgeons at a meeting held at Newton recently. Dr. John A. Grove, Newton, was named president; Dr. Orville R. Clark, Topeka, president-elect; Dr. Robert W. Myers, Newton, secretary-treasurer; Dr. Alfred G. Dietrich, Newton, and Dr. William P. Williamson, Kansas City, councilors.

The scientific program for the day included papers by Dr. Grove, Dr. John G. Shellito of Wichita, Dr. Robert E. Pfuetze of Topeka, and Dr. Stanley L. VanderVelde of Emporia. Dr. Clark was moderator for a panel discussion presented by Dr. Dietrich, Dr. Jack Graves of Wichita, and Dr. Wendell A. Grosjean of Winfield.

Grant for Rheumatic Fever Study

A grant of \$5,500 for a year's study of rheumatic fever in families has been made by the American Heart Association to Dr. Tom R. Hamilton, chairman of the Department of Microbiology at the University of Kansas School of Medicine. The study was begun 21 months ago under a previous grant.

Fifty families with members who have had rheumatic fever have been studied. The use of long-lasting penicillin to prevent throat infections that precede rheumatic attacks was successful, the study revealed. In the next 12 months the program will study "matched" groups of families. Comparisons will be made of families with present cases, those with past cases, and those with no cases in their history.

Society View of Prepayment Plans

The Wayne County (Michigan) Medical Society recently authorized publication of the results of a study made by its Committee on Prepaid Medical Care Plans. The report included the following points: (1) The public wants a medical care plan which provides complete coverage; (2) The medical profession should assume leadership in determining the type and form of prepaid medical plans; (3) A prepaid medical care plan should embody a sense of responsibility on the part of the profession, but just as importantly a sense of responsibility on the part of the patient, and (4) The prepaid medical care plan should preserve the traditional right of the patient to select a physician of his own choosing.

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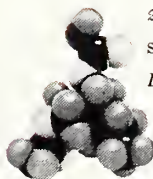
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THE MILTOWN MOLECULE

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

In addition to helping states make monthly public assistance payments to certain indigent persons, the federal government for a number of years also has contributed to the cost of their medical care. Because the grants formula is somewhat complicated, and the amount of medical care varies with the states, this U. S. contribution cannot be fixed definitely. It is estimated at about 90 million dollars a year.

About a third of the states now deposit these federal grants—which must be matched 50-50—in a separate fund, from which the medical care costs are paid directly to the vendors, such as physicians, dentists, hospitals, nursing homes, and druggists. The remaining two-thirds include medical care costs in monthly checks to the indigent and expect these people to pay their own medical bills.

But beginning next July 1, this U. S.-state medical care arrangement is going to be drastically altered.

For one thing, the U. S. will increase its payments from the current \$90 million a year to between \$200 million and \$300 million. For another, *all* medical care money under the new program will be put into a separate fund, from which the indigents' medical bills will be paid, in one way or another, by the state itself.

It is true that in some states the new program will not have much effect. This will be the case with those states that already have a substantial medical care program and see no reason for increasing it and with those unable to raise the matching money.

But the amount of money potentially available to each state is significant, and in most states the change-over from the old to the new systems will have an important effect on physicians and other vendors of medical care. For example, eight states will have "new" medical care funds in excess of 10 million dollars, if they put up half the money. California's potential fund is \$27 million and New York's and Texas' more than \$18 million each.

Before state welfare directors can start operating under the new program, they will have to decide (a) whether they will require doctors to agree to a fee schedule, if one is not already in operation in their indigent care program, and (b) how the doctors will be reimbursed (whether through their societies or other mechanisms, or directly by the government). Some state welfare officials already have approached state medical societies to talk over the situation.

(U. S. contributes to indigents in only four categories—the aged, dependent children, the blind, and the disabled. For their medical care, it will offer states \$3 per month for each adult and \$1.50 for each child, money which the state must match. It is out of these funds that payments will be made for medical care.)

NOTES

Because most applicants did not supply enough information, the council in charge of grants for medical research facilities approved only a handful of projects at its first meeting. Although \$30 million was available, only \$764,159 was allocated. Money went to seven institutions. However, the expectation is that the fund will be just about exhausted at the December meeting of the council, as more than 250 hospitals, schools, and laboratories have asked for money.

First head of the new National Library of Medicine is the man who steered the Armed Forces Medical Library through the last seven troubled years—Col. Frank B. Rogers. He is on loan to PHS, which is in charge of the new institution to be built up around AFML.

Hearings will probably be held in December by the House Interstate and Foreign Commerce committee on federal aid to medical education. The expert panel system will be used, instead of lone witnesses. Currently the committee staff is analyzing information received in response to questionnaires sent out to about 60 organizations interested in medical education.

A six-man advisory committee, named by Secretary Folsom, is attempting to work up suggestions that will help hospitals improve care and reduce costs. Some possibilities: central cafeterias for ambulatory patients, light housekeeping work done by some patients themselves.

Regional Small Business Administration offices now are taking applications for loans to three types of health facilities—hospitals, nursing homes, and medical and dental laboratories. Institutions must be "small" and must be run for private profit.

Real intelligence is a creative use of knowledge, not merely an accumulation of facts. The slow thinker who can finally come up with an idea of his own is more important to the world than a walking encyclopedia who hasn't learned how to use information productively.—D. Kenneth Winebrenner.

Silence is a talent as greatly to be cherished as that other asset, the gift of speech.—Josephine Lawrence.

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Myocardial Infarction

Study of Syndromes Related to Inadequate Oxygen Supply of the Myocardium

BRUCE JOSEPH, M.D., *Honolulu*

Angina pectoris, acute coronary insufficiency, and myocardial infarction are terms which have been applied clinically to three syndromes related to inadequate oxygen supply of the myocardium. Angina pectoris is characterized by anterior chest pain occurring with exercise or emotion or after eating but subsiding with rest in two or three minutes. Myocardial infarction is characterized by severe, crushing chest pain of long duration, associated later with signs of tissue death such as an increased sedimentation rate, fever, and leukocytosis. Intermediate between these two conditions is acute coronary insufficiency, with pain lasting 15 to 30 minutes but without clinical evidence of tissue necrosis. Of course, all degrees of myocardial ischemia occur, producing clinical features varying from one extreme to the other. For this reason the division into three groups, although of clinical significance, is arbitrary.

Relative myocardial ischemia may occur either when there is an increased demand of the myocardium for oxygen, as in tachycardia, cardiac hypertrophy, hypertension, valvular disease, and muscular exercise, or a decreased oxygen supply to the heart. The latter may be the result of anemia, diffuse chronic pulmonary disease, or decreased coronary blood flow.

Since the coronary blood flow takes place during diastole, and is directly proportional to diastolic blood pressure, a lowered diastolic pressure from shock or aortic insufficiency may decrease coronary flow considerably. Thus, rheumatic heart disease can not only increase the work of the heart through valvular malfunction but may also decrease coronary flow if aortic insufficiency is present. Syphilitic aortitis may result in the narrowing or occlusion of the coronary ostia, thus decreasing coronary flow. Emboli can obstruct coronary circulation, but due to the protected position of the ostia behind the cusps of the aortic valve, this is uncommon. Emboli may arise from mural thrombi in the left ventricle, left auricle, and left auricular appendage, and from thrombi on arteriosclerotic

plaques at the root of the aorta. When coronary embolism occurs as a complication of bacterial endocarditis, the source of the embolus is usually a vegetation on the aortic valve.¹ Most commonly, however, myocardial ischemia is at least partially due to intrinsic coronary artery disease in the form of atherosclerosis.² Occlusions generally occur at the site of an atherosclerotic plaque either by superimposed thrombus formation or less commonly by subintimal hemorrhage into a plaque. Rupture of a large atheromatous plaque may allow the pulsatous mass to occlude the lumen completely. Encroachment upon the lumen by a gradually enlarging plaque may eventually result in virtually complete occlusion.

The blood supply to the normal human heart is furnished from the right and left coronary arteries. Normally the right coronary artery extends to the right around the heart in the atrioventricular sulcus and supplies the ventricle and atrium. The left coronary artery divides almost immediately in the anterior sulcus and the descending branch which extends toward the apex in the anterior and the circumflex branch which extends to the left around the heart in the atrioventricular sulcus. In the normal heart there are minute intercommunications between the coronary arteries. In the event of sudden occlusion of a major coronary artery, they cannot prevent infarction. Therefore, the coronary arteries are functionally end arteries although microscopic anastomoses do exist.³ Thus, if occlusion should suddenly develop in the normal heart, infarction of the area supplied by the occluded vessel would most certainly occur. However, the process of atherosclerotic narrowing is generally a slow one, and thrombosis usually occurs at a site previously narrowed by atheromatous plaques.

Blumgart and his group have demonstrated by their injection and dissection technique that collateral vessels invariably develop around a narrowed coronary segment.³ Indeed, they noted that interarterial anastomoses are abundant in hearts with long-standing coronary artery disease. One of the causes of the development of these anastomoses is the anoxia that develops in the region that the narrowed artery supplies.

Zoll and his group⁴ have shown that anoxia due to anemia or diffuse pulmonary disease results in the

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Joseph is now serving his internship at Tripler Army Hospital, Honolulu, Hawaii.

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development of coronary collateral in the absence of coronary artery disease. Wiggers feels that the slow establishment of an increased pressure gradient following partial or complete occlusion distends the normally small and useless vessels until they reach significant size.⁵ This mechanism is usually quite effective since complete occlusion often occurs in atherosclerotic hearts without giving rise to clinical signs or producing extensive myocardial damage.

Blumgart reviewed 12 autopsy cases which gave histories of uncomplicated angina pectoris. Ten of these revealed old occlusions of two main coronary arteries yet showed no evidence of past myocardial infarction. In another series of 49 cases of uncomplicated angina, an average of 3.5 old occlusions per heart was found with no evidence of infarction.⁶ In most of these hearts, focal fibrosis was seen. This would account for the high incidence of death by heart failure in patients with angina. The temporary relative ischemia suffered with each anginal attack or with superadded exercise is apparently sufficient to destroy a few muscle fibers, and thus cumulative loss of muscle eventually leads to enough myocardial weakening to result in failure.

Coronary occlusion and coronary thrombosis are not synonymous with myocardial infarction. Indeed, the former often is present without the latter, and occasionally infarction may result in the absence of complete occlusion. Only in the heart in which there has been insufficient time for the development of collaterals does single occlusion produce infarction. Nor does the site of occlusion always determine the area infarcted. Thrombosis of the right coronary artery may produce infarction of the left ventricle if narrowing or occlusion of the left coronary artery has produced development of collaterals from the right coronary artery to supply the area previously rendered ischemic. This phenomenon Blumgart terms "infarction at a distance."

Schlesinger⁷ has studied variations in the anatomical pattern of the coronary arteries and divided them into three general groups—one with a balanced coronary circulation and the other two with right and left coronary artery preponderance. In the group with the balanced circulation, the right coronary artery supplied the right ventricle and part of the interventricular septum, while the left circumflex and the left anterior descending arteries supplied the left ventricle and the rest of the septum. In hearts with left coronary artery preponderance, the right ventricle was, to an important degree, supplied by the left circumflex and the left anterior descending arteries. In the group showing right coronary preponderance, the right coronary artery supplied a significant portion of the septum and the left ventricle.

The right coronary preponderance group and the

balanced group each comprised about 40 per cent of cases, while the group with the left coronary preponderance comprised only 20 per cent of Schlesinger's cases. In the group with left coronary arterial preponderance, the incidence of arterial occlusions was unusually high, and the incidence of infarction was highest. These infarcts generally resulted in death. These findings are not surprising since in such hearts the left coronary artery supplied a relatively large part of the heart and the pattern of the coronary tree was such that development of collateral circulation from the right coronary artery was difficult. Thus the prognosis of a patient following a coronary occlusion or an infarct is significantly influenced by the original vascular pattern of his heart.

It is apparent, then, that myocardial infarction is usually only one episode in a long process of coronary artery narrowing counterbalanced by the concurrent development of collateral vessels—a race, as it were, between the two processes resulting in varying degrees of ischemia or actual death of cardiac muscle.

Since arteriosclerosis is responsible for coronary narrowing and occlusion, the incidence of myocardial infarction increases with age. It is uncommon prior to the age of 40; and, as with arteriosclerosis, myocardial infarction is much more common in men, occurring about three times as frequently and from five to seven years earlier.⁸ Coronary artery disease is also found more frequently in association with those diseases predisposing to atherosclerosis such as diabetes mellitus, primary cholesterol lipoidosis, and hypothyroidism.

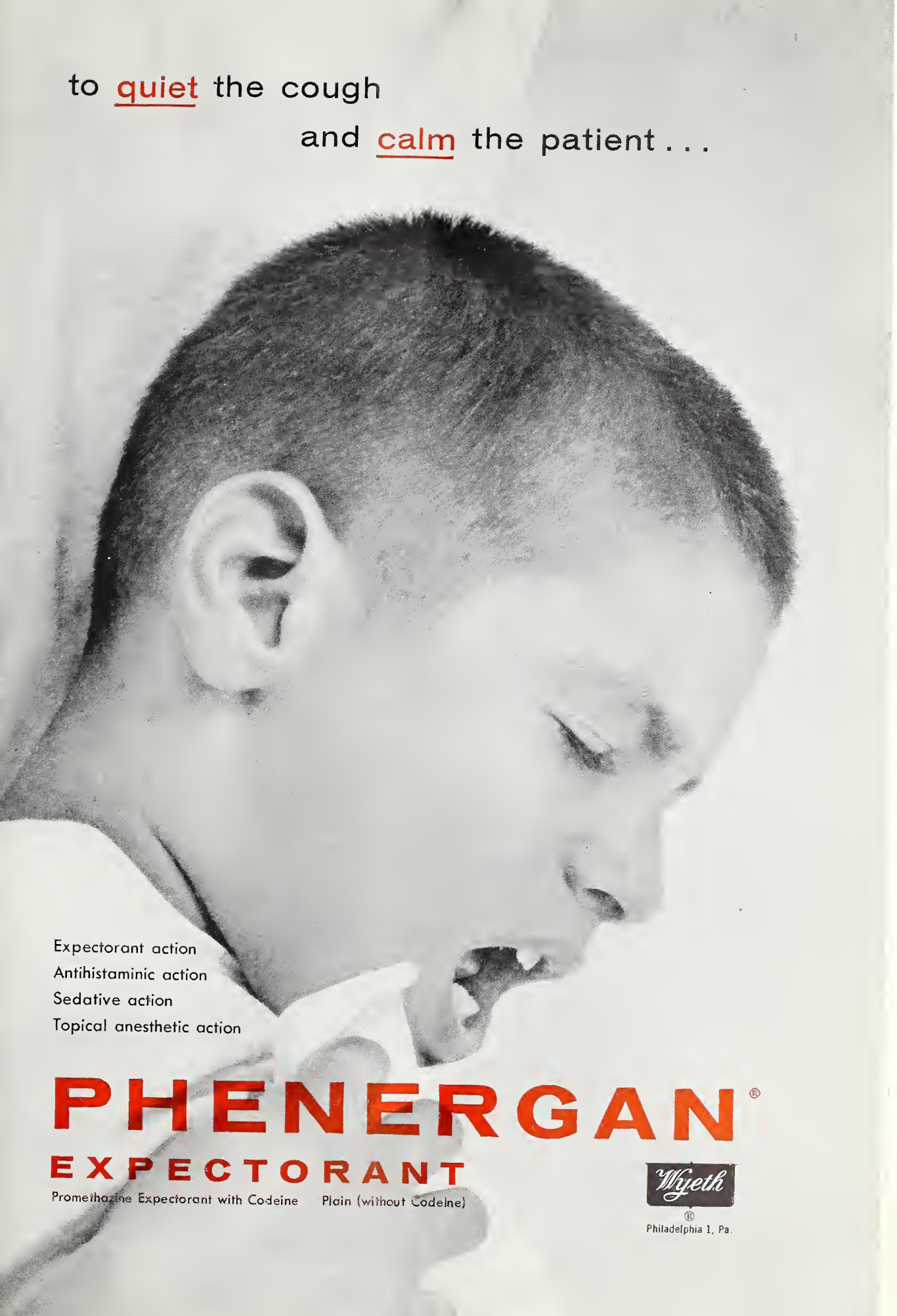
In most cases, acute myocardial infarction occurs without relation to effort, but occasionally shock, hemorrhage, unusual exertion, acute hypoglycemia, precordial trauma, and paroxysmal tachycardia may apparently precipitate an attack.

Factors influencing the onset of angina pectoris and myocardial infarction were evaluated by Master and Jaffe.⁹ Effort or emotion preceded angina pectoris in almost 100 per cent of cases and acute coronary insufficiency in about 50 per cent. On the other hand, unusual exertion prior to myocardial infarction occurred in only 1.9 per cent. This is explained by the fact that in angina the myocardium has sufficient circulation to maintain it while the patient is at rest, but enough added burden in the form of emotion or exercise may render it ischemic. When infarction occurs, however, it is usually due to thrombus formation, and exercise apparently has little effect on this process. Occasionally prolonged exertion in the presence of ischemia may cause infarction.

A case is cited³ in which an individual suddenly afflicted with severe chest pain continued to drive his car for 200 miles. The man died one year later of

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heart failure, and at autopsy a large healed infarct was seen but no occluded vessel was found.

The relatively large percentage of attacks of coronary insufficiency and infarction that occur during sleep is explained by the drop in diastolic pressure at this time.³ This leads to decreased coronary flow in the narrowed arteries, which encourages thrombus formation. The increased incidence of infarctions occurring in states of low blood pressure or shock is well known.

Acute myocardial infarction may be the first clinical manifestation of coronary arteriosclerosis, but in about half of the patients angina pectoris has been present. The onset of myocardial infarction is classically described as sudden, severe, crushing pain over the precordium, which commonly radiates down the left arm. These patients who have previously had angina immediately recognize the increased severity of the pain, its longer duration, and its failure to respond to rest or nitroglycerine. The pain almost always persists for at least 30 minutes and usually for several hours—a dull ache or heaviness persisting as long as two to three days after the pain.

At the onset of the attack the patient demonstrates the first sequel to the infarct—forward failure. The injured myocardium cannot deliver its usual output, and symptoms and signs of shock appear. The patient becomes pale or cyanotic, is bathed in cold sweat, is dyspneic, nauseated, markedly weak, and apprehensive. Physical examination reveals a cold clammy skin, obvious dyspnea, a weak fast pulse, heart sounds of poor quality, and various arrhythmias, the most common being ventricular premature contractions. The blood pressure begins to fall but, contrary to popular belief, a precipitous fall in blood pressure is unusual. Only 9 per cent of Master's series of patients with acute myocardial infarction showed a rapid drop in blood pressure (to less than 100 mm. Hg. in the first day). However, most of the patients had a fairly rapid decline with the lower levels occurring by the third day, although the lowest levels were reached usually between the 12th and the 20th day.¹⁰ If pulmonary edema has developed, the patient may be markedly dyspneic with audible respiratory wheezes and expectoration of foamy blood-tinged sputum. Auscultation of the lungs reveals widespread medium moist and scattered sibilant "asthmatic" rales.

DIFFERENTIAL DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION

I. *Acute Abdominal Disease Confused with Infarction.* This classical picture is subject to variations. The patient may complain of no pain, or only a dull ache or heavy feeling in his chest, and he may present few physical signs. Ordinarily, however, the diagnosis of acute myocardial infarction can be made easily if the characteristic electrocardiographic changes are

present. Confusion with acute abdominal disease is likely when the pain of myocardial infarction is referred to the upper abdomen. Nausea, vomiting, slight distention, fever, muscle spasm and leukocytosis may be common to the two conditions.

Acute cholecystitis, penetrating or perforated peptic ulcer, acute pancreatitis, acute mesenteric thrombosis, renal colic, intestinal obstruction, and acute appendicitis may be confused with acute myocardial infarction. However, the finding of localized pain and tenderness, reflex muscle spasm, and other physical signs of abdominal disorder in the presence of a normal electrocardiogram tends to rule out infarction. Prompt and accurate diagnosis is important lest needless and even fatal abdominal surgery be performed on a patient with myocardial infarction. Conversely, a patient with a ruptured gallbladder or perforated ulcer may be allowed to die if a false diagnosis of acute myocardial infarction is made.

II. *Thoracic Disease Confused with Infarction.* Of the conditions in the thorax which may be confused with myocardial infarction, pulmonary embolism is probably the most common. If a small embolus produces an infarct of the lung, the pain is due to the pleuritis overlying the infarct. However, if an embolus becomes lodged in one of the larger branches of the pulmonary artery, severe chest pain which is indistinguishable from that due to myocardial anoxia may occur, and differentiation must be made from the electrocardiogram. Dissecting aneurysm, hiatal hernia, and mediastinal emphysema may be confused with myocardial infarction or angina pectoris. Therefore, in any case of chest pain, one is duty bound to think of the heart as the source of trouble. A thorough history and physical examination, in addition to electrocardiograms, radiologic examination, and other laboratory tests will usually make possible an accurate diagnosis either incriminating or exonerating the heart.

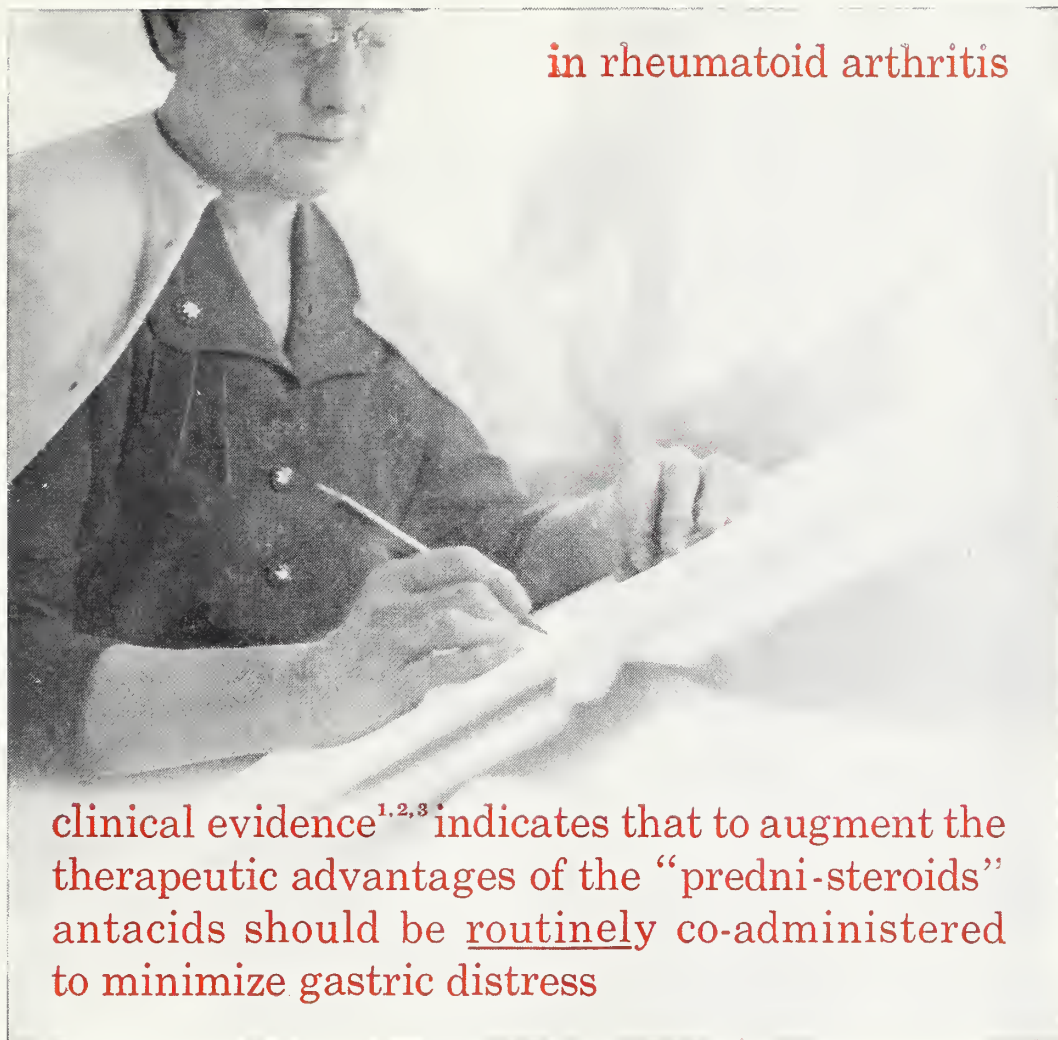
IMMEDIATE TREATMENT OF ACUTE MYOCARDIAL INFARCTION

The immediate management^{11, 12} of the acute attack must be directed toward complete rest; relief of pain, apprehension, and dyspnea; prevention of heart failure and detrimental arrhythmias; and active treatment of shock and acute pulmonary edema if present.

I. *Relief of Pain and Apprehension.* Morphine is the drug of choice to relieve pain and apprehension.

II. *Relief of Cyanosis and Dyspnea.* Oxygen is used in all cases where cyanosis or dyspnea is present. Frequently this also lessens the pain and slows the heart rate.

III. *Relief of Congestive Failure.* When early signs of congestive failure supervene (such as moist rales in the lung bases, venous distention, or peripheral

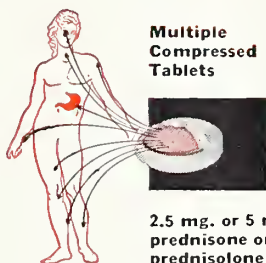


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References: 1. Boland, E. W., *J.A.M.A.* 160:613 (February 25) 1956. 2. Margolis, H. M. *et al.*, *J.A.M.A.* 158:454 (June 11) 1955. 3. Bollet, A. J. *et al.*, *J.A.M.A.* 158:459 (June 11) 1955.


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edema) or with rapid heart rate due to auricular flutter or fibrillation, digitalis should be administered. Askey¹³ concluded from his series of 50 patients with myocardial infarcts treated with digitalis that the fear of catastrophic arrhythmias should not be a deterrent to the use of average doses of digitalis for early signs and symptoms of congestive failure. The mortality in his series of 50 patients treated with digitalis was no greater than in his control group of 50 treated without digitalis.

Coronary vasodilator drugs theoretically should be useful to dilate existing collaterals; however, the use of nitroglycerin is hazardous. Administration of this drug may lead to a consequent fall in blood pressure which may precipitate massive infarction and death.

Wegria and his group¹⁴ observed an increase in cardiac output and heart rate without blood pressure change during glycerol trinitrate administration. Cardiac work was therefore increased. These findings suggest that glycerol trinitrate relieves cardiac pain by increasing coronary flow relatively more than the work of the heart. The authors point out that the drug may actually jeopardize the patient with coronary occlusion by increasing the work of the heart without being able to increase the coronary flow proportionately because of the occluded vessel.

IV. *Prevention of Detrimental Arrhythmias.* The routine use of quinidine or procaine amide is advocated by some to forestall development of paroxysmal ventricular tachycardia or fibrillation. However, in some patients quinidine may cause nausea, vomiting, or diarrhea, and both drugs have been known to cause a fall in blood pressure. There is general agreement, however, that one of the drugs should be given if numerous ventricular premature contractions appear.

SHOCK AS A COMPLICATION

Shock is a common and extremely grave complication that occurs during the first 24 hours following infarction. The degree of shock often exceeds, in proportion, the size of the infarct; therefore, it is probable that resolution of the shock state could lead to recovery in a proportion of patients who now succumb. The exact mechanism of cardiogenic shock following myocardial infarction is still obscure. Boyer¹⁴ has reviewed this problem, and he concludes that the mechanisms are different from those operative in traumatic shock. He believes that neurogenic mechanisms may play a role, but that the bulk of the evidence points to inadequate left heart output associated with a redistribution of blood away from the arterial side producing the picture of collapse. With reduced pressure in the aortic arch, coronary blood flow is correspondingly reduced, furthering the production of myocardial ischemia and preventing compensation by the uninfarcted muscle. With further reduction of

cardiac output, more residual blood remains in the ventricle after systole, and backward failure ensues in the form of acute pulmonary edema.

TREATMENT OF CARDIOGENIC SHOCK


I. Retrograde Intra-arterial Transfusions Under Pressure. The treatment of cardiogenic shock is directed toward raising the pressure in the aortic arch to increase coronary flow and thus prevent further ischemia. The aortic pressure is most effectively raised by retrograde intra-arterial transfusions under pressure. This treatment has been found effective in shock so severe that circulation has almost ceased and irreversible damage to such vital organs as heart, liver, brain, and kidneys has been imminent.¹⁵

Unlike intravenous transfusions, intra-arterial transfusions have been effective with relatively small amounts of blood and have not aggravated pulmonary edema. Indeed, Silber states that the procedure of choice in treating shock where pulmonary edema is present also is the withdrawal of 200 to 400 cc. of venous blood, oxygenating it, and injecting it into the brachial artery under pressure. Berman¹⁶ and his group also have published good results with intra-arterial transfusions in the treatment of cardiogenic shock. However, lack of readily available special equipment plus the technical difficulties involved have thus far prevented the widespread use of this procedure.

II. Sympathomimetic Amines. The use of sympathomimetic amines to effect peripheral vasoconstriction and thus raise aortic arch pressure has proved effective. Miller¹⁷ has reported favorable results with the use of 1-arterenol (Levophed) and suggests that the combination of Levophed and intra-arterial transfusions may be effective in instances where either one alone has failed. Objections have been justifiably raised against the use of epinephrine, which enhances the irritability of the myocardium sufficiently to produce serious ectopic rhythms. Although all sympathomimetic amines in sufficiently large doses will produce ectopic rhythms, 1-arterenol, mephentermine, desoxyephedrine, and others have a greater range of safety than epinephrine.¹⁷

ACUTE PULMONARY EDEMA AS A COMPLICATION

I. Mechanism of Acute Pulmonary Edema. Intravenous blood transfusion, on the whole, has not improved the mortality rate in patients with acute myocardial infarction,¹⁹ and it increases the danger of congestive heart failure. Acute pulmonary edema often develops in the wake of myocardial infarction, and intravenous infusions will encourage this complication by increasing the inflow load to an already weakened heart. According to Harrison and others,^{20, 21}




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this results in an increase in left ventricular diastolic pressure.

If the weakened heart fails to respond by increased force of contraction according to Starling's Law, secondary back pressure elevation occurs in the left auricle and pulmonary venous system. Ordinarily the pulmonary capillary blood pressure is about 10 mm. Hg. while the oncotic pressure of the plasma proteins is about 25 to 30 mm. Hg. However, the lungs do not have a positive tissue pressure to protect them against outward filtration. On the contrary, the negative intrathoracic pressure of -5 to -10 mm. Hg. exerts a suction on the capillary walls decreasing the margin of safety to around 5 to 10 mm. Hg. If the pressure in the pulmonary capillaries rises enough to overcome this margin, transudation of fluid occurs. This, in turn, produces anoxia, which increases the permeability of the vessels and brings about further edema formation. The resultant asphyxia leads to respiratory stimulation, which in turn lowers the mean intrathoracic pressure, causing further inflow into the right ventricle which, in the presence of a diseased left ventricle, results in more pulmonary congestion and edema. This vicious cycle may lead to death if interrupted.

Although this mechanical theory of increased pulmonary capillary pressure has been supported by considerable experimental evidence,^{21, 22, 23} certain instances of pulmonary edema following trauma to or disease of the central nervous system, pulmonary infarction, etc., are difficult to explain on this basis. Luisada and others^{24, 25} believe that acute pulmonary edema may be explained on a neurogenic basis—either through direct excitation of nervous centers as in skull injury and encephalitis or through reflexes arising from stimuli in the heart or lungs and affecting the permeability of the capillaries.

II. *Treatment of Acute Pulmonary Edema.* Although the mechanism of pulmonary edema is controversial, there is rather general agreement on certain standard methods of treatment. First the patient should be placed in a sitting position.

If the patient in acute pulmonary edema following myocardial infarction has not already been digitalized, ouabain or acetyl strophanthidin should be administered intravenously. This causes an increase in ventricular emptying, with an initial rise in cardiac output and a decline in ventricular diastolic pressure. Consequently pulmonary venous and capillary pressures are reduced, pulmonary congestion and edema are lessened, and dyspnea is relieved. This beneficial effect of digitalis cannot be well explained if the neurogenic theory of pulmonary edema is accepted.

Oxygen in high concentrations is effective in that it lessens respiratory center stimulation, thus decreasing the inflow load to the right ventricle. It also re-

verses increased capillary permeability caused by anoxia.

Morphine is effective in that it breaks the vicious cycle by dulling the respiratory center and thus alleviating dyspnea, which in turn decreases inflow to the heart.

Peripheral venous tourniquets to reduce circulating blood volume may be used as an emergency procedure, but the danger of peripheral venous thrombosis contraindicates prolonged use of this method.¹⁸ Venesection will accomplish the same purpose.

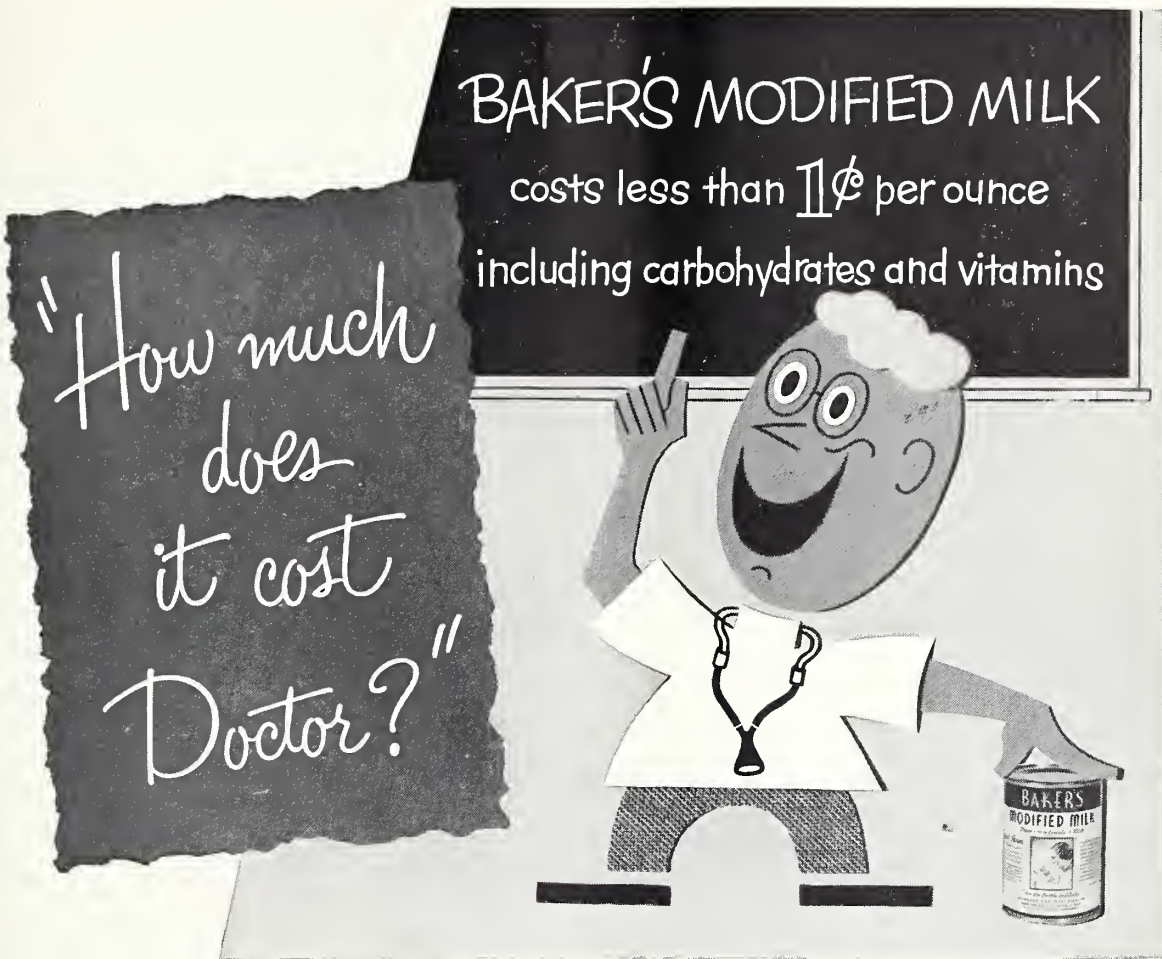
The use of mercurial or other diuretics and a low salt diet reduce edema and thereby tend to prevent nocturnal reabsorption of extracellular fluid. Since such reabsorption is probably the most common mechanism precipitating paroxysmal dyspnea, diuretic drugs are of value in preventing these episodes.²⁰ Diuretics are indicated whenever the patient exhibits increasing dyspnea or rapid gain in weight.

Positive pressure breathing has recently proved to be of benefit.²⁶ This tends to diminish venous return to the right heart by abolishing negative intrathoracic pressure and thus reduces the volume of blood in the pulmonary vascular bed. Also it tends to exert an opposing force to outward filtration through the capillary membrane.

EARLY PATHOLOGIC AND ELECTROCARDIOGRAPHIC CHANGES

Although profound changes in hemodynamics may occur and, indeed, the patients may die soon after the infarction, microscopic sections through the infarct show nothing before six hours. Although this is generally true with human autopsies, Karsner and Dwyer²⁷ noted myocardial changes as early as one-half hour following ligation of a coronary artery in dogs. These changes consisted of poorly outlined areas of congestion, interstitial edema, several small hemorrhages, and slight diminution of transverse striation in the muscle bundles. The reason for this apparent discrepancy is probably that, in human cases, the actual death of muscle cells occurs some time later than the striking clinical picture of chest pain. Existing collaterals may barely maintain the myocardium in an ischemic but living state for as long as several hours.

This also explains why the characteristic QRS changes in the electrocardiogram do not always appear immediately. Electrocardiograms taken during an acute attack show changes corresponding to the histopathologic alterations of the heart muscle. First inversion of the T-wave occurs, characteristic of myocardial ischemia. Shortly following this change, RS-T segment elevation occurs coincident with injury to the myocardium. This current of injury persists sometimes for many weeks, due to extension of the infarct and progressive deterioration of muscle fibers at the



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periphery of the infarct. Upon the actual death of the myocardium, the amplitude of the R-wave decreases and a Q-wave appears. Occasionally these latter changes may not appear until a week or ten days following the "clinical infarct."

SIGNS OF TISSUE NECROSIS FOLLOWING INFARCTION

By the end of 24 hours the patient usually has begun to show signs of absorption of products of tissue necrosis. Fever and leukocytosis often appear at this time—the magnitude of each being roughly proportional to the extent of the infarct. The fever is low-grade, usually not exceeding 101° F., and it may not appear until the second or third day. Occasionally the temperature remains normal. Although high fevers occasionally occur, they should lead one to suspect the possibility of complications such as pulmonary infarction, pneumonia, or other infection. Leukocytosis of 12,000 to 15,000 cells generally parallels fever in intensity and time of appearance. The sedimentation rate does not ordinarily become elevated until the second or third day.

Recently Ladue, Wroblewski, and others^{47a, 47b} have noted a rise in the serum levels of glutamic oxalacetic transaminase in the first three days following myocardial infarction. From 2 to 20 times the normal serum levels was found in 49 of 50 patients with transmural myocardial infarction. A rough correlation between the size of the infarct and height of the serum transaminase level was noted both clinically and experimentally. Although increases of serum transaminase have been noted in cases of active destruction of skeletal muscle and liver and in chronic diffuse liver disease, it is unaffected by angina pectoris, coronary insufficiency, heart failure, or digitalis in the absence of active heart cell damage.

PATHOLOGIC CHANGES IN THE HEART AFTER 24 HOURS

I. *Gross Changes.* If death should occur from shock, pulmonary edema, or ventricular fibrillation 24 hours after infarction, the heart at autopsy would show characteristic changes. The infarct would appear as an indistinct area that was paler and drier than normal with small, blotchy, red-purple areas of hemorrhage that are present focally.

II. *Microscopic Changes.* Microscopically the muscle fibers in this area would appear swollen, opaque, and excessively eosinophilic (brick red); and the nuclei could be made out only with difficulty. The cross striations would be diminished and the cytoplasm would have a granular appearance. At this time a slight degree of polymorphonuclear leukocytic infiltration in the interstitial connective tissue at the margin of the infarct would be seen. The margin of the infarct would be irregular since the area supplied by the occluded vessel would interdigitate with

another area adequately supplied by collaterals. Infarcted areas might actually be separated by viable muscle if a collateral were supplying an area between two branches of the occluded vessel.

MANAGEMENT OF INFARCTION FOR TWO WEEKS

In the period of time from two days to two weeks following infarction, the clinical picture changes rapidly. Two days following infarction the patient may still be in a state of shock and in critical condition. Friction rub may develop at this time, indicating fibrinous pericarditis. Signs of congestive failure may predominate. However, in an uncomplicated course, the leukocyte count and fever are approaching normal by the third or fourth day, and although the sedimentation rate is still elevated the patient is in much better condition by this time.

The patient's electrocardiogram remains essentially unchanged, except for the previously elevated RS-T segment, which drops progressively nearer the base line during this time.

After the severe pain of acute myocardial infarction has subsided (usually in the first 24 hours), codeine may be substituted for morphine for relief of discomfort. Sedation should be provided with phenobarbital, but deep breathing should be encouraged to prevent atelectasis. A program of massage and passive movements of the arms and legs should be inaugurated to prevent venous thrombosis and peri-arthritis of the shoulder girdle.

COMPLICATIONS LIKELY TO OCCUR

I. *Cardiac Rupture.* During the period from two days to two weeks after infarction, the amount of necrotic tissue is at a maximum and very little organization has had time to occur. It is apparent that rupture of the heart is most likely to occur at this time, and therefore rest is of particular importance. Should rupture occur, blood fills the pericardial sac and not only causes collapse of the atria and great veins, preventing filling, but also impedes heart action; death occurs almost immediately. White²⁸ reports an incidence of 3.5 per cent and Gans²⁹ an incidence of 9 per cent of this complication. In mental institutions, where patients are disturbed, agitated, and unlikely to remain in bed, the incidence is higher.²⁸

II. *Thromboembolic Phenomena.* Thromboembolic episodes are among the most dangerous and common complications during this period. Mural thrombus formation may occur as early as 24 hours following infarction, but it is uncommon before the fourth day, after which it becomes increasingly frequent in occurrence up to the end of the first month.³⁰ The danger of systemic emboli to the brain, kidneys, intestine, spleen, extremities, etc., is obvious. If either the brain or intestine is the site of embolization, death may well result.

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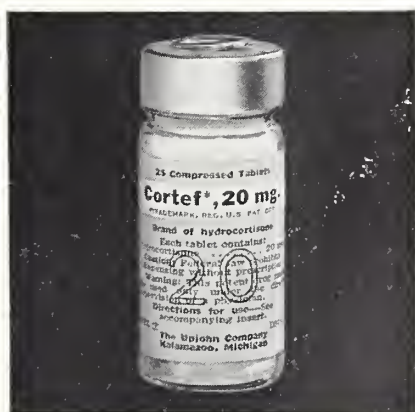
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Should an infarct extend through the interventricular septum or involve the right ventricle, the mural thrombus which forms may send emboli to the lungs. More often, the source of a large fatal pulmonary embolus is a thrombus in the veins of the lower extremity or pelvis. Central or peripheral extension of the original coronary thrombus may occur with occlusion of more arterial branches, leading to necrosis of areas contiguous to the original infarct.

ANTICOAGULANT THERAPY

It was in an attempt to prevent these thromboembolic sequelae that anticoagulant therapy was introduced. In 1946 the Committee for the Evaluation of Anticoagulants in Treatment of Coronary Thrombosis with Myocardial Infarction was established. This committee studied intensively 1,031 cases, 442 of which were treated conventionally and 589 of which were also treated with anticoagulants. Following the committee's report of a 33 per cent decrease in mortality with the use of anticoagulants, their routine use was recommended.³¹

Other investigators have emphasized the difficulty of adequately controlling a study of this kind.³⁴ Doscher and Poindexter³² pointed out that age, sex, pre-existing hypertension, angina, and previous infarction materially influenced mortality rates and that the state of the heart at the time of infarction must be weighed in any statistical analysis of any therapeutic procedure. Indeed, this therapy is not without danger, and reports of the incidence of major hemorrhages secondary to its use have ranged up to 10 per cent.

Bresnick and his group³³ have concluded from their study of 250 cases that anticoagulant therapy as given in a busy general hospital does not reduce mortality from acute myocardial infarction. They point out many difficulties in maintaining patients at sufficiently stable prothrombin levels, especially by those unskilled in its administration. More recently Rytand³⁴ has reviewed the various statistical studies and concluded that there is no valid evidence that prognosis for survival is improved by the use of anticoagulants.

Russek and Zohman³⁵ divided a series of 1,047 consecutive hospital admissions for acute myocardial infarction into "good risk" and "poor risk" groups on the basis of certain prognostic signs. There was an incidence of thromboembolic phenomenon in only .8 per cent of the "good risk" patients. They feel, therefore, that it is unjustified to use anticoagulants routinely since the number of deaths secondary to anticoagulant therapy regularly exceeds .8 per cent. They believe, however, that they should be used in severely ill patients. Since low blood pressures immediately following infarction may lead to extension of the coronary thrombus or formation of a new thrombus, the early employment of heparin in addition to the

more slowly acting anticoagulants may limit extension of the original myocardial infarct. Gilchrist³⁶ used this combination in a well-controlled series and reported a mortality rate reduction from 43 per cent to 21 per cent.

In view of the potential hazards of this therapy, however, one must conclude that only those thoroughly skilled in the administration of these drugs should use them. They should be administered only in a hospital with excellent laboratory facilities, and the recipients of this medication should be thoroughly screened for contraindications. With those limitations in mind, anticoagulant therapy can undoubtedly save lives.

PATHOLOGIC CHANGES FOLLOWING INFARCTION

I. *Gross Changes.* If the patient should die from cardiac rupture, pulmonary or cerebral embolus five days following infarction, post-mortem examination of the heart would reveal further changes. The leukocytic infiltration has progressed, and this can be seen grossly as a yellow-brown, irregular border surrounding irregular pale areas of infarcted muscle. This yellow-brown band becomes broader as leukocytic infiltration becomes more extensive, reaching its maximum width by the sixth or seventh day.

II. *Microscopic Changes.* Microscopically necrosis of muscle is still prominent and is shown by the absence of nuclei and the deep eosin stain of the cytoplasm. At the periphery of the infarct is seen marked polymorphonuclear leukocytic infiltration between and even into the necrotic muscle fibers. This infiltration seems to be limited in extent and toward the center of the infarcted muscle is altogether absent. For this reason, it is of importance to examine the junction of the necrotic with the normal muscle in order to estimate the age of an infarct since centrally the infarct will appear much younger. This leukocytic infiltration is usually more active on the epicardial side of the infarct and in those portions adjacent to uninvolved muscle with good vasculature than at the endocardial edge of the infarct.

By the sixth day many of the polymorphonuclear leukocytes will have become necrotic, and thereafter they gradually diminish in numbers. Newly formed blood capillaries and multiplying fibroblasts can be seen growing into the infarcted area beginning about the fourth day.

There is usually a thin layer of surviving myocardium along the endocardial surface, less than a half millimeter in thickness, which obtains its nourishment from the thebesian veins. Because of the constancy of this finding, Mallory and his group thought it would seem more logical to interpret mural thrombus formation as a result of local dilatation of the heart plus stagnation of the blood in this area rather than as a reaction to the adjacent inflammatory response to the infarct. In many infarcts, particularly those in

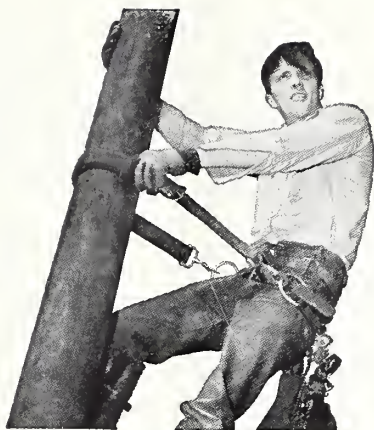
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which the muscle beneath the epicardium is involved, a fibrinous pericarditis can be found after 24 hours. This begins to become organized about the eighth or ninth day.

MANAGEMENT OF INFARCTION AFTER TWO WEEKS

The clinical course from two to four weeks following infarction is in general fraught with fewer dangers than in the acute stage, although thromboembolic complications are commonest during this time. The patient's sedimentation rate is normal, the RS-T segment has returned to the base line, and the T-wave may be upright by this time, although frequently T-wave inversion or flattening remains for years. The Q-wave of muscle death remains. Formerly strict bed rest during this time was advocated; however, the past few years have been marked by a considerable change in thought regarding the value of strict bed rest for the cardiac patient.

Levine and others^{37, 37a, 37b, 37c} noted that strict bed rest is liable to aggravate or bring on pulmonary congestion and edema, a variety of gastrointestinal and urinary symptoms, poor appetite, bed sores, and mental depression. There is now evidence that cardiac work is actually greater when an individual is lying in bed than when he is sitting in a chair.³⁸ While the sitting position permits gravity to mobilize fluid into the dependent parts of the body where it is relatively harmless, the recumbent position encourages the pooling of fluid in the pulmonary circuit where it may be disastrous.^{37, 37a}

Levine found that chair rest during the day and elevation of the head of the bed at night would prevent or alleviate pulmonary congestion and edema and also vastly improve the patient's emotional outlook as well as his respiratory and gastrointestinal function. Chair rest was usually begun sometime in the first week of convalescence, and its duration during the day was determined by the patient's ability to tolerate it without fatigue. Although immediate mortality is not increased by such treatment, such a radical departure from the time-honored bed rest will undoubtedly take years to gain general acceptance. Since many patients cannot use a bedpan without undue straining, a bedside commode has been recommended.³⁹

PATHOLOGIC CHANGES AFTER TWO WEEKS

I. *Gross Changes.* Should death occur two weeks following infarction, the yellow-brown irregular border characteristic of leukocytic infiltration seen at five or six days will be absent. Instead, granulation tissue is seen as an irregular reddish-purple band surrounding the central mass of unremoved infarcted muscle. The color is due to the presence of newly formed capillaries filled with erythrocytes. At this time the myocardial wall is decreased in thickness due

to the actual removal of dead muscle by macrophages. Continued healing results in an increase in the width of the band of granulation tissue, but as it becomes older its collagen content increases, making it appear pale and translucent. At three or four weeks only small islands of necrotic muscle are seen completely surrounded by gray, translucent gelatinous granulation tissue.

II. *Microscopic Changes.* Microscopically invasion into the infarct by young capillaries and proliferating fibroblasts can be seen well at two weeks. By this time, indeed, fine newly formed collagen fibers are present at the periphery of the infarct, and by three weeks the collagen deposition is moderately prominent. The macrophages which have been removing the necrotic muscle are by the 14th day quite numerous and filled with lipofuscin pigment. These pigmented macrophages slowly decrease in number as the infarct becomes older, but they may be found in infarcts more than a year old. Foci of lymphocytes and plasma cells appear with the macrophages but tend to disappear less slowly. A few eosinophils are found at this time.

LATE COMPLICATIONS OF INFARCTION

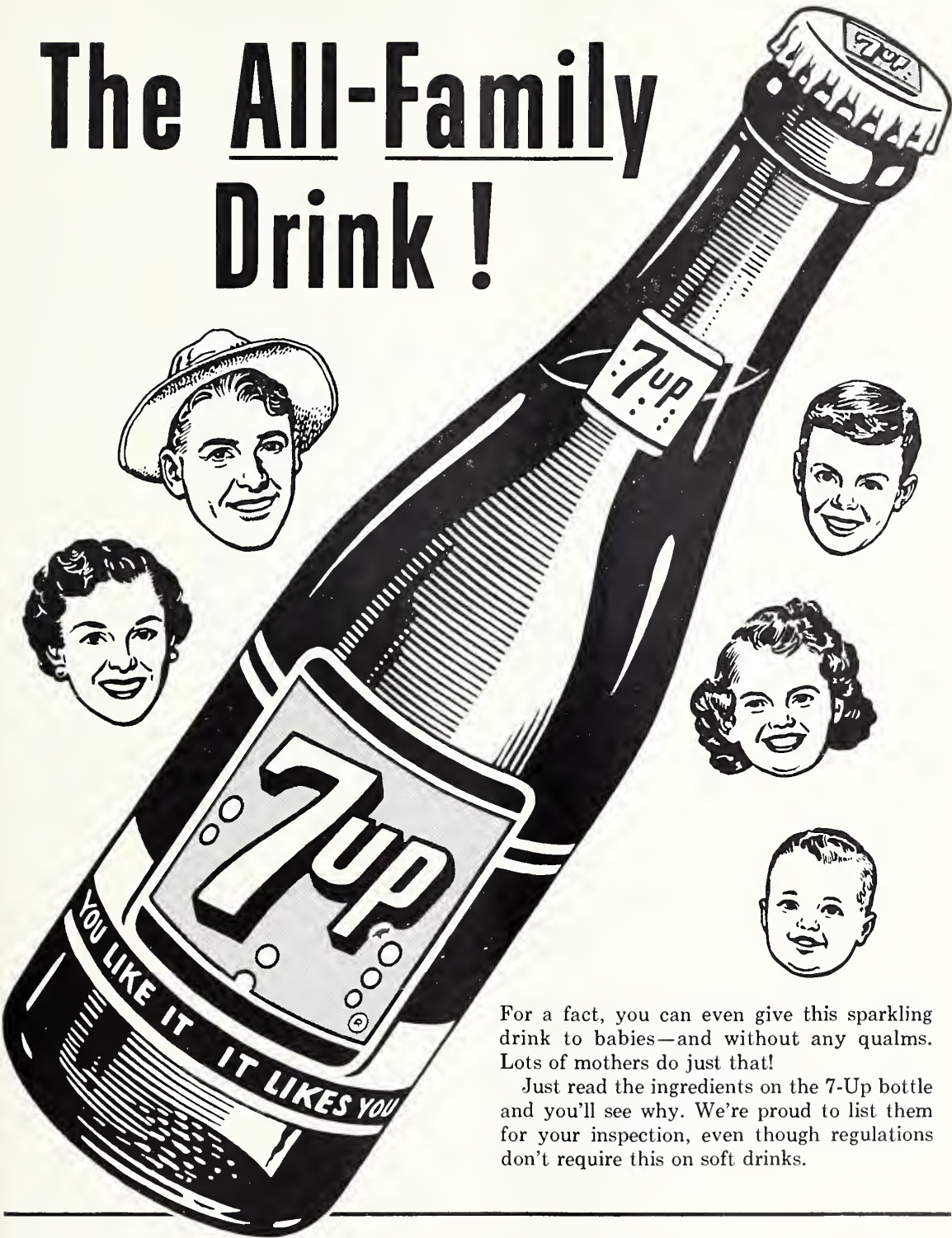
After four weeks the patient may well resume light activity if his course has been uncomplicated. He is at this time and hereafter faced with the possibility of congestive heart failure, but with restricted activity this may often be avoided. However, the fibrous tissue of the scar is not resilient and contractile, and an aneurysmal dilatation may form as the result of the intermittent force of the systolic intraventricular pressure. This occurs in approximately 10 per cent of all cases of infarction.³⁰

Although antemortem diagnosis is infrequent, it is often detectable by fluoroscopy as a bulge with paradoxical pulsation. An RS-T segment elevation persistent several months following infarction has been said to suggest this complication, but Moyer and Miller⁴⁰ state that such a pattern may be found with uncomplicated large myocardial scars when there is extensive destruction of the myocardial wall. Such aneurysms, while undoubtedly decreasing the efficiency of the heart somewhat, are apparently of little prognostic import and rarely rupture.⁴⁰ Mural thrombi may form in the sac and give rise to embolic phenomena at any time, even years later.

LATE PATHOLOGIC CHANGES

I. *Gross Changes.* The pathologic picture of the myocardial infarct after the fourth week is marked by the deposition of collagen. A small necrotic central mass of muscle may persist in large infarcts after the fourth week. This dead muscle has by this time assumed a pale, red-brown color grossly, and it is seen

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to be surrounded by pale, gelatinous granulation tissue containing considerable collagen. By six weeks collagen is quite a prominent feature in the infarct and becomes more and more dense until the end of the second month when this process has reached its maximum. By the second or third month, the infarct appears as a firm, white fibrous scar, and thereafter it undergoes no further change.

II. *Microscopic Changes.* Microscopically collagen is prominent except adjacent to the necrotic muscle. No acute reaction is seen at this junction, but a few lymphocytes and pigmented macrophages are still present.

SUMMARY OF PATHOLOGIC CHANGES

In summary, then, the following changes have occurred:

I. *First Week.* During the first 24 hours, necrosis of muscle with slight polymorphonuclear leukocytic infiltration at the periphery is seen. From the second to the fourth day, the degree of this infiltration increases progressively. On the fourth or fifth day, the first signs of removal of muscle fibers appear. Blood capillaries and fibroblasts can be found penetrating the infarct from the periphery.

II. *Second Week.* It is during the second week that the removal of dead muscle from the periphery of the infarct becomes a prominent histologic feature. By the tenth day there is a peripheral zone, one mm. or more in thickness, from which the necrotic muscle fibers have been almost completely removed. As a result, numerous pigmented macrophages are found. The ingrowth of blood vessels and connective tissue has become prominent. Moderate numbers of eosinophils, lymphocytes, and plasma cells may be seen. By the end of the second week, the polymorphonuclear leukocytes have practically disappeared.

III. *Third Week.* During the third week, the removal of muscle fibers still continues in large infarcts. Pigmented macrophages are numerous. The first signs of collagen formation may be found in the form of fine collagen fibers at the periphery.

IV. *After the Fourth Week.* After the fourth week, recognition of the age of the infarct is largely dependent upon the amount of collagen that has been formed. The serial changes thus far described were taken from Mallory's classic study.⁴¹ He concludes that small infarcts are almost completely healed after five weeks, whereas large infarcts are completely healed, or undergo no further discernible change, after two months.

PROGNOSIS OF MYOCARDIAL INFARCTION

The immediate mortality rate in myocardial infarction is difficult to determine. Series published in the past two decades have varied from 9 per cent to 51.5 per cent.⁹ The average mortality rate is of course im-

portant in evaluating different therapeutic procedures, but in an individual case it means nothing. The size of the infarct, cardiac dilatation, previous hypertension, sex, presence of diabetes, shock, cardiac arrhythmias, embolic phenomena, congestive failure, long duration of pain, have all been said to affect prognosis.^{42, 43, 44} Therefore, the prognosis and the manner of treatment must be individualized in regard to the history and clinical signs of the individual patient.

However, the prognosis of coronary artery disease and particularly myocardial infarction has been studied in several large series and has been found to be rather less grave than is generally believed. Among 679 autopsies⁴⁴ showing old or recent myocardial infarction (of which 20 per cent were not recognized clinically), the average age of death was 67.8 years. Other large series^{45, 46} indicate that the majority of patients who survive a myocardial infarction are able to lead fairly normal lives and to be gainfully employed.

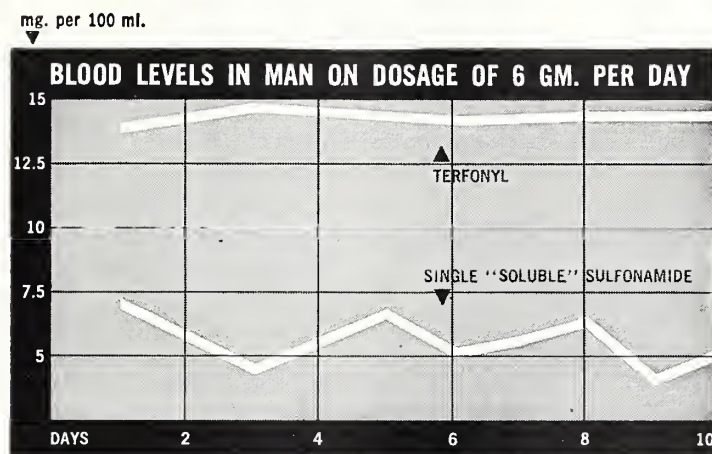
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BOOK REVIEWS

Preventive Medicine in World War II. Volume III. Personal Health Measures and Immunization. Edited by Col. John B. Coates, Jr., M.C., and Ebbe Curtis Hoff, M.D. Published by Office of the Surgeon General, Department of the Army, Washington. 394 pages. Price \$3.25.

The chapters are on manpower selection, personal hygiene, clothing, nutrition, malnutrition, preventive psychiatry, accidental trauma, and the Army immunization program.

The statistical and research findings that are obtained by the Preventive Medicine Section must be implemented through responsible commanders and staff officers. There is a discussion of some of the Army's problems when a great number of men were needed and standards had to be relaxed.

In the chapter on personal hygiene there is a discussion of body cleanliness, insect repellents, use of safe water and food, and sex hygiene. All of these items relate to the spread of disease and are influenced by the individual soldier's willingness to carry out instructions. A glimpse of the problem that the Army faces in providing bathing and laundry facilities for an army overseas is shown.

When the quartermaster is selecting clothing, the elements of exertion, comfort, and health must be considered. In World War II the problem was increased when armies were sent into hot tropical climates and other armies had to operate in subarctic temperatures. In cold climates one of the most troublesome conditions that was met in the field was "trench foot." Here personal hygiene, shoes, and socks were all factors in preventing this condition.

In the section on nutrition there is considerable discussion of the nutritional value of the "standard ration" and also the nutritional value of the foods that are actually accepted by the soldier. Field rations under combat conditions could not always be assembled in such a way as to assure adequate nutrition for long periods of time.

In the section on preventive psychiatry we find that in World War II, for the first time, an effort was made to distinguish between preventive and clinical psychiatry. Psychiatric screening with classification

for jobs was attempted. Group work in mental hygiene was stimulated by psychiatric personnel in the Army, and some psychiatrists worked with staffs attempting to understand better motivation, morale, leadership, and utilization of men in the Army. It appears that there was no ideal method that provided proper classification and support for the inductee in his early Army training.

Accidental trauma is discussed as historically important in loss of manpower in all previous wars. Non-battle injuries account for many deaths and much disability that occurred in World War II. In the southwest Pacific area during 1943 there were 930 killed in action, 574 non-battle casualties, 152 deaths due to disease, 94 deaths from wounds. About one-half of the deaths in this area were due to non-battle casualties. The accident prevention program in the Army is discussed briefly.

In the chapter on immunization there is detailed discussion about the development and difficulties with yellow fever vaccinations, the adoption of tetanus immunizations, its policy in the use of typhoid, paratyphoid vaccine, the selected use of cholera, plague and typhus vaccinations, and discussion of the Army's use of influenza vaccination.

The book is written by a number of authors, one for each chapter. There are many quotations from reports and bulletins from the War Department and many references not quoted. It is a frank account of some of the problems that the Medical Department of the Army faces in preventing disease and disability. Summaries and conclusions are not common in the book. It is somewhat on the order of "Here are the facts—you can draw your own conclusions." The book probably is best considered as a reference book.—C.H.M.

Hunterdon Medical Center: The Story of One Approach to Rural Medical Care. By Ray E. Trussell, M.D. Published by Harvard University Press, Cambridge. 236 pages. Price \$3.75.

I would say that this book is a MUST for all of us interested in community hospitals. Certainly this is a most complete record of the trials and errors, triumphs and tribulations in the building and operation of a community hospital. The author formerly served as the director of this hospital in New Jersey, and he is now executive officer of the Columbia Uni-

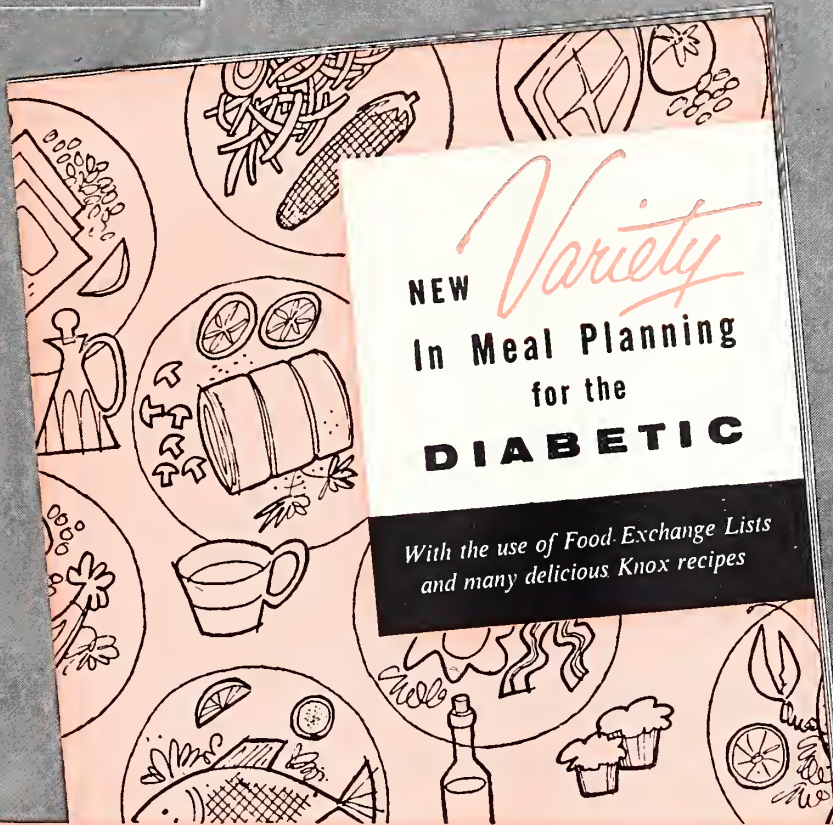
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1. Developed by the U. S. Public Health Service assisted by committees of The American Diabetic Association, Inc. and The American Dietetic Association.

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versity School of Public Health and Administrative Medicine.

During the seven years from the origin of the idea of the Hunterdon Medical Center to its completion in 1953, a step by step report, almost a diary type of record of aims, objects, progress, achievements, and failures is recorded in this book. Here we find probably the most modern and realistic ideals in medical center existence possible for most any community.

This beautiful and adequate hospital center is associated with a medical teaching institution and is supervised by the medical school of New York University, but the resident, or in the vicinity, physicians are all general practitioners. The active staff is composed of physicians already resident in the area before the hospital was built. The university acts in a supervisory, consultative, and specialist technique capacity.

This is a pattern that could be followed by many rural communities and medical schools, especially since development of the turnpike system of roads and air service. The Hunterdon plan gives the people all the advantages of medical school expert consultation and supervision without sacrificing the personal relationship between the patient and his family physician. By this plan even house calls are not a neglected or forgotten part of the medical system. Such a plan also provides interns or residents with excellent training in the Art of the Practice of Medicine. Such an arrangement as Hunterdon on the part of a medical school should be an excellent internship in general practice.

This community effort of the 40,000 people of Hunterdon County, New Jersey, should be carefully studied by every community planning a hospital. It should also be studied by the administrator and dean of every medical school, for it offers a possible solution to two of our present health education problems. Hunterdon represents a real social movement of a democratic nature. To my knowledge this is the first time a small rural hospital has been directly associated with a large urban university medical center. Hunterdon represents a new formula for rural community medical service wherein patients remain under the care of their family physicians and yet have the complete cooperation and guidance of a full-time specialist staff supplementing the family physician.

Hunterdon is a new adventure in medicine. I predict that the happiness and success of Hunterdon will be repeated many times in the next 20 years.—C.M.B.

Histamine. Ciba Foundation Symposium with the Physiological Society and the British Pharmacological Society. Published by Little, Brown and Company, Boston. 472 pages, 133 illustrations. Price \$9.00.

In April, 1955, a symposium on histamine was presented under the joint cooperation of the Ciba Foundation and the Physiological Society and the British Pharmacological Society. The text contains the papers and discussions presented at this meeting. Forty-four separate papers on histamine were given. These contained the latest facts concerning the physiological and pharmacological properties of histamine. The text is probably the greatest single source of information concerning histamine and histamine research today.—R.W.W.

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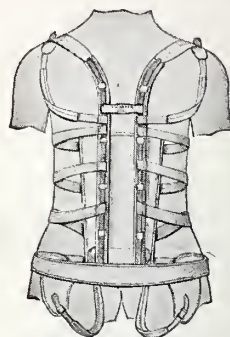
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graph is adapted
Altemeier, Cul-
Sherman, Cole,
& Fultz.¹



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TABLE OF CONTENTS

DECEMBER, 1956

Scientific Articles

The Goat Gland Surgeon—The Story of the Late John R. Brinkley—Jack D. Walker, M.D., Girard	749
Huge Inguinoscrotal Hernia—Surgical Repair in One-Stage Procedure—Donald R. Davis, M.D., Mission, and William Brown, M.D., Paola	756
Obstetrical Training—Scope of Work and Experience in Medical School, Internship, Residency, and Practice—William C. Keettel, M.D., Iowa City	760
Kaw Valley Heart Association—Report on a Health Education Experiment—E. Grey Diamond, M.D., Kansas City	762

Editorials

Medicare	767
American Association of Medical Assistants	770
Federal Health Expenditures	771

Miscellaneous

Just Browsing	773
Official Proceedings	774
Tumor Conference—Malignant Melanoma of the Conjunctiva	775
Myxedema in Hyperthyroidism—Report of a Case and Review of the Literature—Senior Thesis	779

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DECEMBER, 1956

No. 12

The Goat Gland Surgeon

The Story of the Late John R. Brinkley

JACK D. WALKER, M.D., *Girard*

Now and then there appears in our society an individual possessed of better than average mental ability, personality, and talent who could with little effort go far in almost any legitimate field of endeavor, but who unfortunately perverts his talents by directing his efforts toward taking advantage of his unsuspecting fellow men. Such individuals live by Barnum's famous theory, "There's a sucker born every minute." Such persons find a fertile field among the gullible, the ignorant, and the sick.

Those who prey upon the physically ill are perhaps the most ruthless of all. They exploit the prerogatives of men of medicine for their own personal gain with little real concern for their victims. We often refer to such persons as "quacks" or "charlatans." Such an individual was the late John R. Brinkley.

Brinkley arose from obscurity, made a gesture at gaining a medical education, obtained medical certificates under false pretense, and set forth upon a career of curing the ill in a fashion which has never been matched before or since. He completely disregarded the established code of medical ethics. He advertised with all the skill of a modern huckster. He poured tons of printed material before the public through the press, magazines, and the mails. He capitalized on a new invention, the radio, to disseminate his propaganda throughout the land.

In a few short years he created his famous hospital, made his first million dollars, came close to being governor of Kansas, and was owner and operator of the most powerful radio transmitter in

North America. He developed an army of fanatical followers, and he also developed a small group of bitter enemies. It was this latter group which eventually brought an end to his infamous career. But let's examine a little more in detail the cavortings of this man from Milford, Kansas.

Little is actually known about the first 30 years of Brinkley's life, and apparently he wanted it just

This paper outlines briefly the rise and fall of the flamboyant practitioner who made his first million dollars in Kansas and came close to being elected governor of this state, who moved to Texas and Arkansas to keep ahead of the law, and who died in bankruptcy while awaiting trial on a charge of using the mails to defraud.

that way. He gave out meager information concerning his past, and about all that is known came out when he testified in the innumerable legal involvements which were a constant feature of his later years.

He was born somewhere in North Carolina in 1885. Knowledge of the true nature of his grammar school education is vague. He once presented a diploma from a small eastern academy of liberal arts as evidence of his premedical education. The records of that school show no evidence of his at-



Figure 1. John R. Brinkley, 1922-1923.

tendance. He later presented a diploma from the National University of Arts and Sciences in St. Louis. Some years later an official of that school admitted under oath that Brinkley's diploma, along with hundreds of others from that school, was bought for a fee with no evidence that he had ever attended the school.

Brinkley's medical education, being a matter of more direct interest in later years, is a little easier to elicit. He did attend a Bennett Eclectic Medical School in Chicago from 1908 to 1911, but did not graduate. In 1914 he studied a year at the Eclectic Medical University of Kansas City, Missouri. He was graduated on May 7, 1915, and received a medical diploma, although at the time the school was not recognized by licensing boards in some 40 states. He immediately applied for and was granted a license to practice medicine by the state of Arkansas in 1915, and by reciprocity the state of Kansas issued license No. 5845 to him in 1916. He served a total of three months in the United States Army in 1917.

In 1919, for good measure, Brinkley obtained a medical certificate from the Kansas City College of Medicine and Surgery. This same school a few years later was the subject of a nationwide scandal in which the school became known as the "diploma mill." Hundreds of medical certificates had been issued for a cash consideration, and John R. had been one of the customers. And so I repeat, Brink-

ley's early life and his educational record are a bit vague, to say the least.

Brinkley went to Milford, Kansas, following his discharge from the Army in 1917. Milford was a wide spot in a country road with a population at that time of less than 100 and a third class post office. "I came to Milford," said Brinkley, "because I was broke and needed a job. Milford needed a doctor. I arrived in Milford with \$23 in my pocket and a medical bag. I did general practice for several years, barely making a living. And then one day I hit upon the idea of my famous goat gland operation." And this is where Brinkley's fabulous career really begins to unfold.

One of the inevitable consequences of aging in the human male animal is the gradual onset of sexual impotency. This is loss of a most valuable physiological possession, and almost every man would be happy to regain this lost symbol of virility. Brinkley reasoned, and correctly so, that if he could offer a cure for this problem, hundreds of frustrated males would beat a path to his office. He reasoned also that those who seemed to gain some of their lost manhood, and some claimed they did, would spread the word; and that those who were disappointed—well, they would be a little reticent to talk about their impotency and their unsuccessful attempts to become rejuvenated.

The procedure was called the "compound operation." Brinkley in his advertising and later in testimony claimed that he thought out the theory of the operation and perfected the technique himself. He speculated that as sexual impotency develops there is a concomitant enlargement of the prostate gland. The enlarged prostate "robbed" the testes of their nerve and blood supply, resulting in a "softening" of the testes and impotency. To correct this situation



Figure 2. Brinkley's first hospital, Milford, 1922.

he proposed his compound operation. The procedure consisted of the following steps:

1. Injection of the seminal vesicles through the vas deferens with Mercurochrome solution in order to destroy any existing infection.
2. Taking a small piece of muscle or fascial tissue containing a small nerve and artery from the scrotum and suturing it into the epididymis or testicle.
3. Implantation of a portion of a goat testicle under the covering of the epididymis or into the testicle.

The charge was \$750 per customer.

Brinkley flooded the mails with literature which was carefully planned and carefully worded. Every reader felt that this literature was describing his own case. Brinkley was not at all modest in his methods. One of his favorite pamphlets was entitled "Your Health." The following passages are taken from it:

"The compound operation stands out as a marvel of surgical technique. It is new in conception, embodies sound principles, and is an epical contribution to the grand science of surgery."

"This unique operation, conceived, attempted, perfected, worked out in its last detail, is a crowning achievement for its originator. If he should do no more, he has rendered a service to humanity that will live for centuries to come."

"How this operation, which I call 'Compound Operation' consists of adding a new artery and nerve to the patient's own sex glands. This artery and nerve give added nerve and blood supply. In addition to this, I add some pure, fresh, healthy, animal gland

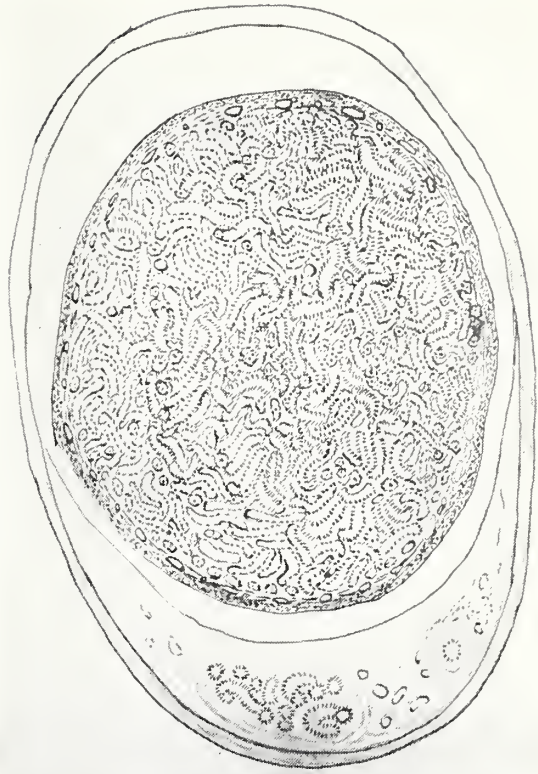


Figure 4. A drawing by Brinkley, 1920, to show a cross section of testicle of young goat.



Figure 3. A drawing by Brinkley, 1920, to show seminiferous tubules, testicle of young goat.

tissues which act as a 'charger' (battery charger or fertilizer) to your glands. This animal gland tissue gives a 'kick' and with the nerve and artery added, the 'Compound' combination causes your own glands to begin functioning again. Regardless of how old you may be, there is good for you in this combination."

"The Compound Operation is the best thing known for impotency, high blood pressure, enlarged prostate, sterility, some forms of diabetes, epilepsy, and dementia praecox."

Brinkley closed each advertisement by asking readers to write to him for further information concerning their health problems. Once a reader took the bait, he was put on the mailing list and showered with additional literature. This mailing list grew rapidly, and Brinkley was on his way. The post office at Milford became second class and then first class.

Brinkley needed more help, so he added to his staff several graduates from the Kansas City College of Physicians and Surgeons. He initiated plans for a new clinic and small hospital. He built a radio station, KFKB. Radio was a new thing to most people, and, because of the powerful transmitter, any radio

could pick up KFKB. Brinkley owned and operated the station and hired entertainers to sing and play throughout the day and evening, and between programs he spoke to the radio audience about their medical problems and about his ability to correct their problems. By 1929 Brinkley, Milford, and KFKB were known throughout the midwest. Milford then had a population of several hundred, new streets were under construction, and a hotel and various business houses had been built. Brinkley had constructed a clinic, a small hospital, a radio station, a new church, and numerous homes and apartments for his staff.

At about this time, as might be expected, Brinkley began to expand his field of endeavor. One of his daily programs from KFKB was called "The Medical Question Box." Listeners would write to Brinkley describing their medical symptoms. He in turn would read their letters, using some code name in order to mask the actual identity, diagnose the case, and prescribe medicine over the air. He had a list of his own special prescriptions which were given out by number, and listeners could obtain them by writing to a given drug store in Milford. Before long Brinkley began to receive numerous complaints from druggists throughout the state that customers were demanding Dr. Brinkley's prescriptions, and they were unable to supply them. Out of sympathy Brinkley finally consented to make his prescriptions available to several hundred midwestern druggists. For each prescription filled the druggist returned one-half the cost to radio station KFKB or indirectly to Brinkley.

The following are excerpts from "The Medical Question Box":

"You are listening to Dr. John R. Brinkley speaking from his office over station KFKB. We must dig into our question box this morning. The first code is DES from somewhere in Missouri. She states her case briefly as follows. She had an operation with her appendix, ovaries, and tubes removed a couple of years ago. She is very nervous and has dizzy spells. She says the salt solution and constipation and liver medicine have already benefited her. In answer to your question, I am more or less of the opinion that your symptoms are to a great extent those of premature menopause. In my practice in such cases as this I have for many years used prescription No. 61 for women. I think also you should use special prescription No. 50, and I think if you would go on a vegetable diet, a salt free diet, for awhile and use prescription Nos. 64, 50, and 61, you will be surprised at the benefits you will obtain."

"A lady in Oklahoma wires from Caldwell, Kansas. You give this young lady of yours prescription Nos. 61, 67, and 50, and she will be all right. You take

some of her No. 50 yourself and also No. 80, and both of you will be all right."

"Here's one from Tillie. She says she had an operation for some trouble ten years ago. I think the operation was unnecessary. My advice to you is to use women's tonic Nos. 50, 67, 61. This combination will do for you what you desire if any combination will after three months persistent use."

"Alarmed Over My Condition. You are 50 with four children, a busy life, and only fair health. My dear lady, you ought to get busy on prescription No. 50 for women, 61 for women, 68, and 79 for women, and don't forget your Maltine, milk and cream, and cod liver oil."

And so on and on for several hours each day. Brinkley's cut on this prescription plan was estimated to have reached \$7,000 a month at one time.

About the same time the good doctor added a unique refinement to his gland operation, a kind of super special offer. In selected prospects Brinkley sent out circulars with the brazen heading, "Why Be Half Human and Half Goat?" It went on to say that if the reader was suffering from impotency and was contemplating a goat gland operation, he could have genuine human glands implanted for a fee of \$5,000. The following is part of a letter sent by Brinkley to a potential customer:

"My Dear Mr.

"If each of your friends will come at the same time and will pay \$5,000 each for a genuine human gland operation, I will give you the same kind of human gland operation which I perform at a minimum fee of \$5,000. Few surgeons can get human glands, but I have an old-time friend in one of our large cities that can supply me.

"I guarantee the human glands to be pure and healthy and absolutely free from disease. I will guarantee that the seller of them will not be over 35 years of age insuring strong, virile glands.

". . . When I give you a human gland operation, I am giving you the most precious thing in the world and something that men can seldom buy."

Brinkley was at the height of his career. He was shipping goats from his goat farm in Arkansas at the rate of 50 a month. The money was pouring in, and he was well on his way to making his first million dollars. He surrounded himself with expensive cars, owned two yachts, and covered his person with sparkling diamonds. And yet, above the din of this success, the first faint rumblings of impending trouble could be faintly but distinctly heard. A few disgruntled clients who were more interested in their empty bank accounts than they were in their pride began to tell their experiences to newspapers, to lawyers, to legitimate medical men. As soon as the

ice was broken the complaints became numerous, and soon several important agencies were taking more careful note of Dr. Brinkley's antics.

One of the first public servants to openly voice opposition to Brinkley was the *Kansas City Star*, a powerful newspaper in the midwest. Even before the medical profession seemed to take note the *Star* had become aware of the true nature of Brinkley's "racket," and the *Star* waged an intensive campaign of exposing Brinkley to its readers. The late A. B. McDonald of the *Star's* staff, probably more than any other single individual, was influential in the campaign against Brinkley.

The Kansas Medical Society in 1929 and 1930 slowly began to build a case against Brinkley. It was not easy to do. Brinkley had an enormous following. For every affidavit condemning Brinkley, there were ten supporting him. Brinkley saw the opposition forming and used his powerful radio station to appeal for support. He filled the mails with literature giving his side of the story. His counterattack was most effective, but slowly the opposition gained support. The American Medical Association threw the weight of its powerful magazine behind the move to expose and stop Brinkley. The editor of the *Journal of the American Medical Association* at that time was Dr. Morris Fishbein. From his editorial page Fishbein began to hammer at Brinkley from every angle.

One federal agency began to look into Brinkley's affairs. The Federal Communications Commission in Washington began a careful study of the broadcasting methods of KFKB. Through the efforts of the *Kansas City Star* and the Kansas Medical Society, a convincing case was completed against Brinkley, and on March 28, 1930, the assistant attorney general of Kansas drew up a formal complaint against Dr. John R. Brinkley. The complaint was signed by Dr. L. F. Barney, retiring president of the Kansas Medical Society. The complaint charged that Brinkley was a quack and a fraud and asked that his medical license be revoked. The complaint was filed with the Kansas State Board of Medical Registration and Examination, Dr. J. F. Hassig, chairman.

The legal maneuvering in the following months went something like this: The board presented the charges to Brinkley and, as required by law, gave him a specified length of time to answer the charges and show cause why his license should not be revoked. Brinkley answered the charges but failed to convince the board, so his license was revoked on September 17, 1930. This, of course, stopped Brinkley himself from practicing in Kansas. It did not, however, stop his assistants, and business went on about as usual. He could not prescribe over his radio

station, but he could still talk and refer his clients to his staff.

In May, 1930, however, the Federal Communications Commission revoked the license of KFKB on the grounds that it was not performing a public service. This stopped Brinkley cold for a short time since his chief mode of advertising was gone. However, he had heard of a new radio station located on the Rio Grande River in Mexico, and this station was even more powerful than his own station. Brinkley made arrangements with this Mexican station, XER, to carry his broadcasts by remote control. He rented telephone lines from Milford, telephoned his broadcasts to Mexico, and XER beamed them across the border into the south and midwest with impunity. Brinkley was back in business again.

In 1931 he decided to make a last ditch stand to regain his license to practice in Kansas. He filed a civil suit asking for an injunction restraining the action of the Kansas Medical Board, and thus restoring his license. The case was heard before a federal judge in Utah, and an opinion upholding the medical board was handed down. Thus for all practical purposes John R. Brinkley was through as a practitioner of medicine in Kansas.

Brinkley was down but not quite out. He was still broadcasting by remote control, and his staff was still working in Milford. The Federal Communications Commission delivered the *coup de grâce* in late 1931 when it passed a ruling directed rather pointedly at Brinkley. The ruling stated that the use of telephone wires to carry material outside of the continental United States for the purpose of broadcasting such material back into the United States by way of a foreign radio was illegal. Brinkley was out of business in Kansas.

At this point we should interject one of the high points of Brinkley's career, for it dramatically points up the shrewdness of the man. When Brinkley first became aware of impending difficulties with medical authorities in Kansas, he set about on a much more direct route to defend himself against what he knew was bound to come. Brinkley decided to become governor of Kansas. The reasoning was sound. If he were governor he would be in a position to apply legal and political leverage against those who opposed him.

The year 1930 marked Brinkley's first and most successful attempt to gain the governorship. He filed late in the campaign and was not successful in getting his name printed on the official ballot. Brinkley campaigned vigorously with a large staff, sound trucks, airplanes, and his own special \$7,000 Cadillac. It must be remembered that this was the depth of the depression. The people of Kansas were hard hit and desperate for anyone who could promise them

better times. Brinkley promised everything. He advocated free school books, free license tags, a lake in every county, lower taxes, and, according to his political enemies, a goat in every back yard.

Brinkley ran a close second in one of the wildest gubernatorial races Kansas has ever known. There are many who maintain that Brinkley actually won the election. Since his name did not appear on the ballot, it had to be written in by the voters. The election officials ruled that only the name J. R. Brinkley could be counted. Consequently, untold numbers of votes were thrown out because his name was written in other forms. He even polled 20,000 votes in Oklahoma, and he was running in Kansas. It was several days after the election before the people of Kansas actually knew who had been chosen governor. As it turned out, Harry Woodring squeaked in by a very small margin.

In 1932 Brinkley ran again as an Independent candidate, this time with his name on the ballot. He again campaigned vigorously with every resource at hand. Brinkley desperately wanted to be governor. This time, however, he ran a poor third, and no ballots were thrown out. He did manage to split the Democratic vote which was sweeping the nation behind Franklin Roosevelt, thus causing the defeat of the incumbent, Woodring, and allowing a Republican, Alf Landon, to become governor of Kansas.

Following his defeat at the polls in 1932, with his medical license gone and his radio station out of business, Brinkley said farewell to Kansas and headed for Texas. He probably realized from the onset that he could not hope to win the battle in Kansas. As early as 1930 he had begun building a new Brinkley hospital in Del Rio, Texas, a small town directly across the Rio Grande from the radio transmitter XER. Brinkley was shrewd. He fought a delaying action in Kansas with every legal maneuver possible, and all the time the money was pouring in at his hospital in Milford. When the end finally came in Kansas, he simply moved his equipment and staff to Texas and in a short while was in full operation again.

Brinkley was a temperamental person, and he was quite bitter over the treatment he received in Kansas. He sent long letters to thousands of persons lamenting the abuse and suffering which had been directed at him by the medical men and newspapers of Kansas. He also reminded each reader that he was still in business at a new location.

The story of Brinkley in Texas is pretty much repetition of his activities in Kansas. Through station XER in Villa Acuna, Mexico, he continued his medical question box, and at his new, lavish hospital

in Del Rio he went right on "rejuvenating" old men.

He added new ideas from time to time. Intravenous therapy was coming into its own by 1936, and he saw financial possibilities there. He came up with an intravenous injection of "goat gland extract" which could help less severe cases of impotency. It required three injections, and each injection cost \$100. A few skeptical medical men finally had an ampule of the solution analyzed by the chemical laboratory of the American Medical Association. A part of their report is as follows:

"Analysis of Formula Number 1020 of J. R. Brinkley, M.D. Each ampule contained about 20 cc. of a clear solution having a sky blue color. Spectrographic analysis indicated the presence in extremely small amounts of such metallic elements as silicon, zinc, iron, copper, sodium, magnesium, and calcium. The organic blue material was a dye of the indigo type. Such a solution is essentially water to which has been added a dash of blue dye."

Dr. Fishbein and the American Medical Association followed Brinkley to Texas with their attacks. It was not long after his arrival in Del Rio that the Texas State Medical Society began to cause trouble for the doctor. But, just as in Kansas, it was difficult to form a legal case against the man, and for several years Brinkley enjoyed uninterrupted success. He built a spectacular mansion in Del Rio equipped with neon lights which flashed "Dr. J. R. Brinkley" in the front yard. He lived lavishly with a fleet of automobiles, diamonds, and two yachts. He traveled in Europe and reportedly became a millionaire for the second time.

The first real blow to his career in Texas came when the Mexican government shut down radio station XER. The United States State Department was directly responsible for this. Mexico had no desire to eliminate the American dollars that Brinkley was pouring into XER. A long series of diplomatic negotiations in which the United States Department of State had to resort to rather strong language finally forced the Mexican government to take action against XER. This of course was a severe blow to Brinkley's advertising.

By 1940, with his radio station gone and with the medical people of Texas hot on his trail, Brinkley's establishment at Del Rio was beginning to falter. Particularly disturbing at this time were a number of large damage suits on file against him by disgruntled patients. His income had dropped alarmingly, and he had found it necessary to dispose of his yachts and some of his cars.

Realizing that his success in Texas was about at an end, Brinkley made plans to move to a new location. He purchased a country club in Little Rock,

Arkansas, and began the organization of a new Brinkley Hospital. He moved his staff to Little Rock, but this hospital never got into full operation. He did manage to distribute considerable literature through the United States mails from the Little Rock location, and this proved very shortly to be a rather bad mistake.

Meanwhile, back in Texas he had suffered several rather severe setbacks. Several of the large damage suits had been returned in favor of the plaintiff, and in early 1941 Brinkley was forced to file voluntary bankruptcy. He listed debts of \$1,118,000 and assets of \$316,000. For lack of funds he was forced to close the doors of his new hospital in Little Rock after only a few months of operation. Brinkley's empire was crumbling around him.

During the spring and summer of 1941, Brinkley was occupied with bankruptcy proceedings and damage suits. Trouble poured in from every angle. Several additional damage suits against him had been filed, and because of these pending legal actions Brinkley was finding it convenient to take an extended vacation from the state of Texas.

In August, 1941, while sojourning in Kansas City, Brinkley suffered a blood clot in an artery of one leg. Gangrene resulted, and it became necessary as an emergency procedure to amputate one leg.

One month later, while he was still convalescing at Research Hospital in Kansas City, the long arm of the federal government finally caught up with Brinkley. He was arrested by a United States marshal on September 23, 1941, on a charge of using the United States mail to defraud. It was the last shipment of

literature from Little Rock which had caused the federal government to act. Brinkley accepted the challenge, and from his hospital bed he informed his public that he would answer the charges and emerge victorious.

Brinkley returned to his home in Del Rio, but ill health continued to plague him. He was scheduled for trial late in the spring of 1942, but he never had to answer the charges. He died from a heart attack on May 26, 1942, at the age of 56.

Brinkley was a genius—a blatant, egocentric, supershowman. No one can deny that he possessed a fair amount of basic medical knowledge. If he had chosen to apply his abilities toward legitimate fields of endeavor, he might have made a notable contribution in the field of medicine. As it is, medical history remembers him only to condemn him.

And so ends the story of the goat gland surgeon, John R. Brinkley.

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If one would understand older people, one should first forget age. Oldness is not so much passing a certain birthday as it is the rearrangement of a complicated set of physical, mental, social and economic circumstances. One must not label a man who has lived a lot of years as an old person. For an individual who has early formed good habits of living, picked up the important techniques of adjustment and acquired a good attitude or philosophy, life continues to be an ever-increasing adventure in development. Development can continue at sixty, seventy and eighty as surely as it did in youth.—*William B. Terhune*

Huge Inguinoscrotal Hernia

Surgical Repair in One-Stage Procedure

DONALD R. DAVIS, M.D., *Mission*, and WILLIAM BROWN, M.D., *Paola*

It is uncommon to encounter huge inguinoscrotal hernia in this day and age because most persons suffering from inguinal hernia undergo early surgical repair. Occasionally, however, inguinal hernias will be neglected because of lack of intelligence on the part of the patient, poor physician advice, or some intercurrent medical condition prohibiting corrective surgery. The repair of voluminous inguinal hernias is always a major surgical undertaking, and, as a rule, the surgical difficulties encountered are directly proportional to the size of the hernia.

In addition to profound alteration of anatomical relationships, certain changes occur in the abdominal wall which frequently cause formidable problems for the surgeon. When a portion of viscera has been extruded outside the abdominal cavity for a long period of time, as occurs with a huge hernial sac, the parietes of the intra-abdominal cavity are adjusted to the visceral contents remaining within it. In such an instance there exist, in fact, two separate cavities. The intra-abdominal and extra-abdominal cavities are connected by a narrow channel, the hernial neck, to form an "hourglass" type of peritoneal cavity. Because of the contracted nature of the intra-abdominal cavity, difficulty is frequently experienced at operation in reducing displaced organs into the abdomen because of inadequate space. With regard to this disturbing situation it has been said the viscera "forfeits the right of domicile."

The necessary extensive handling of viscera and resultant increase in intra-abdominal pressure with reduction in these cases may precipitate a state of shock. Also, these factors may contribute to a stubborn variety of postoperative ileus.

Massive inguinoscrotal hernias frequently have a sliding component on one or both sides, more frequently on the left where the mesosigmoid may actually make up a portion of the sac wall. Anatomical structures to be used in repair are usually greatly distorted, altered in texture, and of poor substance for reconstruction into a satisfactory barrier against recurrence of hernia. The increased susceptibility of these patients to thrombophlebitis, phlebothrombosis, and pulmonary embolism should not escape mention.

The following case seems worthy of reporting

because it represents a truly massive bilateral inguinoscrotal hernia treated successfully with primary (one-stage) surgical repair following a five-day preoperative period of scrotal suspension and partial gravitational reduction.

CASE REPORT

Mr. G. K., a 66-year-old white farmer, was admitted to the Miami County Hospital, November 29, 1955, complaining of a "big hernia" of 15 years duration, crampy abdominal pain, shortness of breath,

Although huge inguinoscrotal hernias are seldom seen today, an occasional patient is incapacitated because of the size of such a lesion. Surgical repair is not impossible on the basis of size alone. The patient here described was returned to a productive, comfortable life.

vomiting, abdominal distension, and constipation of several days duration. Similar symptoms, though less severe, had been present at various intervals for several months. He was barely able to walk without assistance, and he shuffled along in a stooped-over fashion, his legs widely splayed and his suspenders extended to their limits to allow room in the crotch of his overalls for the watermelon-sized mass between his thighs. He was in obvious distress and was immediately put to bed.

In 1941 he discovered a finger-sized mass in the right groin. He consulted his family physician, but no treatment was advised. The mass gradually increased in size, and in 1944 a similar swelling appeared in the left groin. Once again he consulted his family doctor, and still no treatment was advised. Both masses became steadily greater in size, and in 1948 he consulted a different physician and was told the hernias were too large to repair surgically. The hernias became "very large" during 1950 and 1951, and since that time he had been unable to do the chores about his farm. Both hernias have been irreducible for seven or eight years.

He consulted one of us (W. B.) several weeks before this admission, and at that time he was found to be suffering from cardiac decompensation of a

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mild order. The huge hernias were noted, and plans for surgical repair were discussed.

For several months previous to admission, he said, he had experienced episodes of symptoms suggestive of partial, intermittent intestinal obstruction. Until the most recent episode, however, his symptoms had subsided spontaneously at home with bed rest.

Examination revealed a well-developed, somewhat obese, white male in acute distress with abdominal pain. His temperature was 99.6 degrees Fahrenheit, his pulse 88 per minute, his respiration 26 per minute, and his blood pressure 200/100 mm. Hg. A soft, blowing, systolic murmur could be heard over the fifth interspace on the right, his lungs were clear to percussion and auscultation, and grade 1 (on the basis of 4) pitting edema was noted in both lower extremities. His abdomen was moderately distended with gas, and high-pitched peristaltic rushes could be heard on auscultation. No abdominal masses were noted, muscle guarding was absent, and rebound phenomenon was negative.

The huge bilateral inguinoscrotal hernias extended very nearly to the inner aspect of his knees, the scrotal skin presented an orange rind appearance with pitting edema, and the penis was lost in a tunnel of skin reminiscent of textbook pictures of scrotal elephantiasis caused by filarial infestations (Figure 1). Peristaltic waves could be visualized over most of the scrotum. Considerable tenderness was noted throughout the scrotal mass, and patchy areas of moist dermatitis caused by poor hygiene were present.

The laboratory report showed a red blood count of 4,620,000, a white count of 9,600, and hemoglobin of 14.0 grams. Differential count yielded 80 per cent segmented polymorphonuclear leucocytes, 16 per cent lymphocytes, and 4 eosinophiles. Urinalysis showed a specific gravity of 1.023, pH 6, 1+ albumin, and positive tests for acetone and diacetic acid. Urine sugar was not present, and microscopic examination was negative. VDRL was negative, non-protein nitrogen was 36.5 mg. per cent, and urea nitrogen 18.1 mg. per cent.

It was apparent the patient suffered from intermittent partial intestinal obstruction, caused by his incarcerated hernias, and had done so at various intervals for several months. Because of the massive size of his hernias and associated scrotal edema, and the general poor condition of the patient, it was our opinion that emergency attempts at surgical reduction would be unsatisfactory and extremely dangerous. Accordingly, we decided to place the patient in a position favorable for gravitational reduction because we felt his symptoms of obstruction would abate as scrotal, mesenteric, and visceral edema subsided and partial reduction was accomplished. A Foley catheter was placed in the bladder for continuous drainage,

and his hernias were elevated in a sling fashioned from turkish towels suspended with ropes from the outrigging of a fracture bed (Figure 2). Moderate Trendelenberg position was maintained.

In this manner the peritoneal "hourglass" was tipped upside down, so to speak, placing the abdominal cavity in a position dependent to the hernial sacs. Time was then allowed for gravitational reduction of hernial contents and resorption of edema fluid.

Symptoms of intestinal obstruction subsided promptly, and he showed signs of general improvement. He was placed on a maintenance dose of digi-toxin, 0.2 mg. daily, supported with intravenous feedings for two days, and thereafter he was able to take his fluid and food by mouth. Serpasil, 0.25 mg. was administered four times daily, and he was placed on a salt-free diet because of hypertensive cardiovascular disease. Steady improvement ensued with diminution of scrotal edema and the size of his hernias. It was estimated that approximately 25-35 per cent of hernial contents were repositioned within the abdomen by the scrotal suspension method. On the fifth day after admission to the hospital, the



Figure 1. Preoperative photograph taken after four days of treatment with scrotal suspension and mild Trendelenberg position (see Figure 2). It is estimated the hernia was 25-35 per cent larger than this on admission. Note the well-outlined coils of intestine within the scrotum.

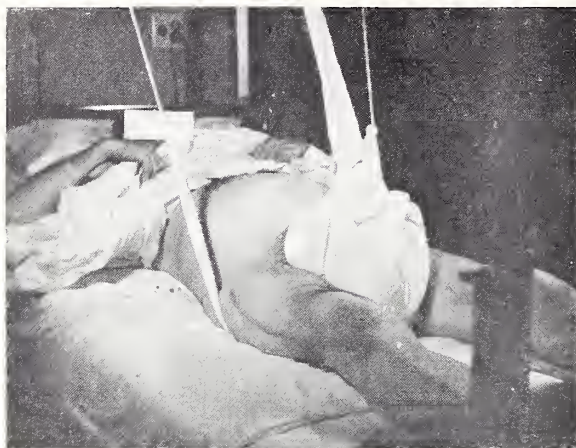


Figure 2. Scrotal suspension apparatus fashioned from turkish towels and fastened with ropes to the outrigger of a fracture bed. This appliance was used with mild Trendelenberg position for five days prior to surgery.

patient was submitted to bilateral hernia repair as a one-stage procedure under high single-shot spinal anesthesia with 20 mg. of pontocaine hydrochloride.

Repair of the right hernia: The operation was begun with a standard oblique incision on the right and the aponeurosis of external abdominal oblique muscle divided superiorward from the external inguinal ring. The hernia sac was opened, separated from the spermatic cord, and dissected free down to its neck which occupied a position lateral to the inferior epigastric vessels (an indirect hernia). Care was taken not to injure or handle excessively the extruded viscera which consisted of greater omentum, many coils of small intestine, the cecum, appendix, and a portion of ascending colon. While reduction was being attempted, the visceral mass was supported gently with warm saline packs to prevent excessive drag on its mesentery.

Efferent ileum and afferent ascending colon were identified, the patient was placed in steep Trendelenberg position, and reduction was started on the ileal side, replacing intestines a coil at a time until all displaced viscera had been returned to the abdominal cavity. Little difficulty was encountered. The sac was then dissected out by blunt and sharp dissection and its neck closed by means of a purse-string suture of #0 chromic catgut. After the sac was amputated, its ligated neck was transfixed behind the rectus sheath. An Andrews-Bassini repair was carried out, sewing the conjoint tendon to the reflected portion of Poupart's ligament with interrupted #00 silk. The aponeurosis of external abdominal oblique muscle was then closed over the spermatic cord with imbrication.

The tunica vaginalis consisted of a hydrocele containing approximately 250 cc. of fluid and was treated with a Bottle operation. Drainage was established by means of a Penrose tube emitting through a stab wound at the most dependent portion of the scrotum.

If difficulty had been encountered in reducing the right hernia, it was our plan to terminate the operation after completion of the right side and repair the left hernia at a later date. Because of excellent anesthesia and short operating time on the right hernia, and the general satisfactory condition of the patient, we elected to repair the left hernia and complete the operation as a one-stage procedure.

Repair of the left hernia: The left hernia was approached in a manner similar to that for the right side. When the sac was opened, it was found to contain many loops of small intestine and a sliding hernia of the sigmoid colon, the sigmoid mesocolon making up a large portion of the postero-lateral aspect of the sac wall. After reduction of small intestine was accomplished, the anatomical relationships of hernia sac, sigmoid colon, and mesosigmoid were noted carefully. Reduction of sigmoid colon and mesosigmoid was accomplished by the method of Williams,⁵ and all denuded areas were peritonized before repositioning the sigmoid and mesosigmoid back into the abdomen.

Because the abdominal rent was large (7 x 8 cms.), orchidectomy was done as a part of the repair. The sac was dissected out from its scrotal confines, purse-stringed at its neck with #0 chromic catgut, then amputated together with the testicle and spermatic cord, dividing the cord at the inferior brim of the hernia opening. The ligated neck of the sac was transfixed behind the rectus sheath, and the conjoint tendon was sutured to the reflected portion of Poupart's ligament with #00 silk. After closing the aponeurosis of external abdominal oblique muscle, imbricating its superior and inferior leaves, dependent drainage was established as on the opposite side.

The scrotum, which had been greatly stretched from prolonged internal distention, was wrapped in gauze and incorporated into the dressing above the abdomen. No effort was made to excise redundant skin.

At no time during operation did the patient show signs of shock, and his condition was excellent at the end of the procedure. Careful attention was paid to his blood pressure during the postoperative period. He was given fluids parenterally, penicillin and dihydrostreptomycin were given to combat wound infection, and continuous bladder drainage was maintained by Foley catheter. His immediate postoperative



Figure 3. Postoperative photograph taken four months after surgical repair. Note how near the scrotum has returned to normal and the minimal amount of skin redundancy.

course was smooth, and on the third postoperative day he was permitted to sit in a bedside chair. Thereafter, ambulation was steadily increased until his dismissal from the hospital on the 14th postoperative day.

Since leaving the hospital the patient has made favorable progress and is now able once again to participate in normal activities about his farm. The personality change observed in this man is noteworthy; his mood has changed from one of depression, introversion, worry, fear, and even shame, to that of a man full of hope and vigor with a great deal of enthusiasm for life. Too, his cardiac status has improved remarkably since operation, and further improvement can be expected. The patient was examined on March 27, 1956, and the sites of both hernia repairs were found firmly healed and secure. Scrotal redundancy has reduced greatly, having returned to nearly a normal state (Figure 3).

DISCUSSION

This man was completely incapacitated for useful life because of huge inguinoscrotal hernias. He had been declared "inoperable" in pursuit of surgical

help. He was truly a miserable person, mentally as well as physically, and he was faced with certain life-threatening complications suggesting to him his end was near. With the patient's full knowledge of the risks involved, surgical treatment was successfully carried out and the patient was returned to a productive, comfortable life.

Several methods of dealing with "contraction" of the abdominal cavity associated with large hernias of long standing have been advocated in the past and are still used today in selected cases. Preoperative pneumoperitoneum to stretch out the abdominal cavity, resection of a portion of extruded viscera, the production of a ventral hernia as a safety valve, and staging of the operation have been the most popular. We are of the belief that much can be accomplished to overcome the problem in many instances by scrotal suspension for a few days to allow for gravitational reduction of hernia contents and resorption of scrotal, mesenteric, and visceral edema. Steep Trendelenburg position and complete abdominal relaxation are mandatory for successful operation.

While certain inguinoscrotal hernias may appear inoperable because of their huge size, we are of the opinion it is incorrect to judge such hernias inoperable on the basis of their size alone. Walters and Baskin,⁴ Thorek,³ Glasser and Mersheimer,¹ Sica,² and others agree with this view and point out that great improvements have evolved in recent years regarding the safety with which such formidable operations may be undertaken. While we realize the repair of such surgical curiosities is not without danger to the patient, we are also impressed with the many dangers associated with the non-operative treatment of huge hernias. Accordingly, it is our feeling that, barring some medical contraindication to safe operation, all patients with huge inguinoscrotal hernias should be considered candidates for surgical repair.

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Obstetrical Training

Scope of Work and Experience in Medical School, Internship, Residency, and Practice

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As physicians deeply interested in obstetrics and gynecology, we can be justly proud of the progressive attitude of our specialty, manifested in many ways. The American Board of Obstetrics and Gynecology was one of the first organized to improve the training and qualifications of the specialist. For many years those in our specialty have been interested in maternal and infant mortality surveys, and marked improvement in maternal and perinatal mortality has resulted from such studies. It is interesting to note that these activities were started years before "tissue committees" were being considered. Obstetrical departments in most hospitals have been adequately organized, and obstetricians have long recognized the need for regulations concerning consultations and the management of complicated problems.

Residency programs for individuals interested in specialty training in obstetrics and gynecology have been well organized and directed, and for that reason need not concern us. However, whether or not the average general physician has a similar opportunity for adequate training in obstetrics is worthy of our consideration.

In a rural state such as Iowa there are approximately 40 certified specialists in the larger cities. These physicians care for and deliver between 8,000 and 9,000 patients per year. Twelve per cent of the deliveries are performed by them, and 88 per cent are performed by general physicians. A further breakdown of these statistics reveals that the majority of deliveries are done by physicians performing less than 50 deliveries per year. Thus, almost 90 per cent of the obstetrical care is given by the physician in general practice. We in Iowa feel this is a healthy trend and that normal obstetrics should continue to be an integral part of the general practitioner's practice, particularly in rural areas.

In the midwest home deliveries are uncommon, so 98.1 per cent of births occur in hospitals. Many of these hospitals (49 per cent) are in communities of fewer than 5,000 people. These small community hospitals are of 50-bed size or smaller, many having been built since the war with federal matching funds.

They are often beautifully equipped, with all the newest instruments for performing the more complicated surgical procedures. Unfortunately, such vitally important adjuncts as adequate nursing personnel, proper anesthesia, and prompt availability of blood are often lacking. Despite these disadvantages, hospital facilities are usually adequate for good obstetrical care.

Some will say, "Granted these are facts, this is not a serious problem as there is always a specialist available to serve as a consultant for the complicated patient." To a certain extent this is true. However, in certain communities the obstetrician and gynecologist

This study points up deficiencies in our present training pattern, outlines the need for a new type of study, and suggests a program for the future.

colleague does not serve as the consultant. There are many reasons for this. One may be that the obstetrician delivers a number of uncomplicated better paying patients; another is the fear that the referred patient will often stay with the specialist. Thus, the practitioner may choose the general surgeon as his consultant for both obstetrical and gynecological problems since he is not considered a competitor.

The next question we must ask ourselves is, "Will this trend in rural obstetrics continue?" It would seem that the answer must be in the affirmative since at present it is economically unprofitable for the specialist to locate in smaller communities. But, with the trend in medical practice for several doctors to associate or to form small clinic groups, there will be a decrease in the number of individual physicians doing obstetrics. In these smaller groups one physician may have an interest in several different branches of medicine, and this permits him to keep up with advances in several fields.

All of us have known and greatly admired certain general physicians who have developed a special interest in obstetrics and over the years have contributed much toward improving the quality of med-

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icine in their communities. These men often deliver a large number of babies and in addition serve as consultants to many of their colleagues. In practical knowledge and know-how they are often the equal of qualified specialists. Unfortunately, there are not enough physicians of this type in any state.

Let us now briefly consider the obstetrical training of the average generalist to see why men of the type mentioned above are not more numerous. His medical school training has been carefully scrutinized, so there is surprising uniformity in his academic experience. He had a series of lectures on normal obstetrics during his sophomore year. In the junior year of medicine he heard lectures on abnormal obstetrics and gynecology; in addition, he served as a clinical clerk. In either the third or fourth year he delivered some patients, the number depending upon the volume of charity patients. Between the junior and senior year, if his medical school had a preceptor program, he received additional obstetrical experience. This seemed particularly valuable to him for it emphasized the importance of common problems. Thus, in medical school he received thorough didactic training and was well grounded in scientific fundamentals. After this training he was duly graduated and was expected during his internship to gain the necessary practical experience for licensure.

What type of training did he receive during internship? Internship was devised 25 years ago to provide a means of bridging the gap between didactic teaching and practical experience. During that particular phase of medical education it served a useful purpose, but today the medical student has had clerkships in both the junior and senior years and has actually performed the duties of an intern on many of the services.

Thus, the internship has not basically changed and has not kept abreast with other advances in medical education, nor has it been as carefully supervised and organized as specialty or medical school training. If the medical student chooses to intern at a university hospital, he finds himself competing with the resident and the senior clerk on the ward, and he soon feels he has little responsibility for treatment of the patient and often loses interest.

On the other hand, if he chooses to intern in a private hospital, he no doubt will receive an attractive salary but may find himself doing chiefly histories and physical examinations. He further learns that he cannot direct treatment and is permitted little individual initiative. Often there is no planned teaching program for him, and in reality he is doing clerical work so that the hospital records will meet the requirements of an accrediting board. He may perform

a few deliveries on charity cases or when the physician does not arrive at the hospital.

It should be realized that many of these statements are relative and are mentioned only to emphasize important points. There are many excellent internship programs in university, city, county, and private hospitals. But we must ask ourselves, "Are there enough of these excellent training programs and do these meet all the needs for training of the general physician? Do they give enough practical experience in obstetrics and office gynecology?"

To solve this problem it would seem there are a number of things that can be done. First, serious thought must be given to revising and improving the quality and the type of training received during internship. Secondly, some of our residency programs could be individualized to meet the needs and desires of physicians being trained and the needs of the community.

The person interested in teaching or wishing to practice a strict specialty in a larger city might profit by four years of training. Those interested in additional training beyond an internship but not desiring complete specialty training could be given six months of obstetrics and office gynecology and six months of pediatrics.

Attempts have been made to start general practice residencies, but so often they are in competition with an intern and specialist program and offer only token experience. A better alternative would be a carefully directed program in a well qualified service devoted to six months in obstetrics with good gynecologic outpatient experience and six months of pediatrics. This would be invaluable after an internship. These physicians then could go out to rural areas not as specialists but as general physicians interested in obstetrics and pediatrics. They could practice alone or in association with a group of doctors. Many will say this poses the possibility of these physicians acting as specialists and performing gynecological surgery. Admittedly there is that danger, but this can be minimized if individuals so trained are properly selected.

General physicians interested in obstetrics should have a society for scientific advancement. It would seem that our state obstetrical and gynecological societies should serve this purpose. (However, in certain areas, membership in these state societies is restricted to those with board qualifications.) At these meetings members of the society should be encouraged to discuss and present papers. One will be surprised at the excellence of their presentations. At a recent combined refresher course and meeting of our state society, many of those attending felt papers given by our society members were more informative than those given by our guest speakers.

Since the majority of obstetrical patients in rural states will continue to be cared for by the generalist, this phase of training should be carefully reviewed. Is it realistic of those in our specialty to spend so much time and effort in undergraduate teaching of obstetrics and gynecology and then offer so little experience to the generalist who will do the major share of obstetrics?

In this brief discussion an attempt has been made to point out deficiencies in our internship programs. Is there a need for revision of our thoughts concern-

ing the internship? Perhaps there is a place for an intermediary type training for those interested in obstetrics who wish to live in small communities unable to support specialists. It is suggested that six months of training in obstetrics and six months in pediatrics after an internship would provide excellent training for physicians who would fulfill a need in our rural areas.

Department of Obstetrics and Gynecology
State University of Iowa Hospitals
Iowa City, Iowa

Kaw Valley Heart Association

Report on a Health Education Experiment

E. GREY DIMOND, M.D., *Kansas City*

The Kaw Valley Heart Association has now (July 1956) completed its first 18 months since organization. Its original officers have retired, and it seems appropriate to review the origins, purposes, and accomplishments of this association.

ORIGIN

National Organization: In May, 1924, six men founded the national organization, the American Heart Association. They were Paul D. White, Joseph Sailer, Hugh McCulloch, Robert B. Preble, Robert H. Halsey, and Lewis Conner.

This initial organization was founded for the specific purpose of conducting scientific meetings, and the national meeting became a well accepted and useful professional gathering.

In June, 1948, the original purpose of the American Heart Association was modified and expanded to that of a voluntary health agency with the intent elaborated to include not only the original scientific meetings but also fund raising activities, lay health education, and the support of research in the various fields of cardiovascular disease.

State and Local Organizations: As an extension of the American Heart Association, state and regional chapters were established throughout the United States, and in January, 1949, the Kansas Heart Association was founded. In October, 1950, the Wyandotte County, Kansas, Heart Association was founded. In 1953, Johnson County, Kansas, formed its own local chapter.

Kaw Valley Heart Association: Throughout the state of Kansas during the years of 1950 to 1954,

fund raising drives were increasingly successful. However, interested lay people and physicians of the Johnson County and Wyandotte County area decided in 1954 that their problems of cost and administration could be simplified and reduced if these two adjacent county organizations joined into a single

This report describes how the educational framework of a medical school can be combined with the administrative staff of a voluntary health agency to develop an intensive health education service for people in that region, utilizing local physicians and the medical staff as instructors. Through physician-speakers, literature, exhibits, and films, facts about heart disease are brought most effectively to the public.

heart association. The counties in the immediate surrounding area bordering on the Kaw River Valley were invited to form a nine-county organization to be identified as the Kaw Valley Heart Association.

The member counties were Atchison, Doniphan, Douglas, Franklin, Jefferson, Johnson, Leavenworth, Miami, and Wyandotte.

PURPOSES

From its inception, the Kaw Valley Heart Association has had a unique intent. The attainments of the national and state organizations in the field of scientific organization, fund raising, and investigation

have been immense. Although a considerable amount of effort had been put into lay education literature and programs, it was felt by the founders of the Kaw Valley Heart Association that this area, namely, bringing effective "heart" education to school children, teachers, parents, employees, and employers deserved exploration. As a pilot program, in an effort to explore effective means of reaching the lay public with health education programs about heart disease, it was decided to combine the resources of the teaching staff and audio-visual equipment of the University of Kansas Medical Center with the administrative staff of the Heart Association. To further identify this educational association, the Kaw Valley Heart Association was housed on the Medical Center campus.

This association with the Medical Center was intended for the sole purpose of strengthening the efforts of the Heart Association in reaching the lay public and in presenting to them health education in the general field of heart disease. Although it was recognized that the Heart Association would also be involved in fund campaigns, this was considered a separate function, distinct from the medical school's interest in the health education program.

It was hoped, by utilizing the physician as a teacher and supporting him with films and audio-visual aids, that effective instruction of the public could be obtained. It seemed apparent that this type of education should be in the hands of physicians and medical schools and should not reach the public through newspapers and magazines. By telling people about their hearts and offering informal question and answer periods, it was hoped to create a knowledgeable public, one which is aware of how much is known about the heart and how little is known,

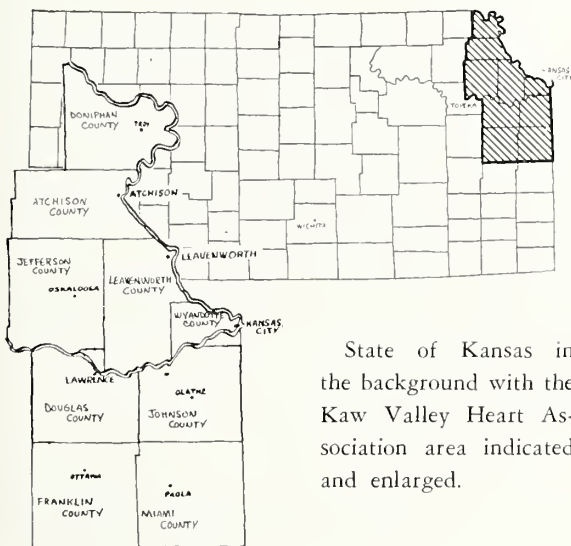
the need for preventive measures, what to expect in terms of good medical care, and fields which still need investigation and, therefore, financial support.

ACCOMPLISHMENTS

It was intended that the primary function of the Kaw Valley Heart Association would be one of *service*. The extent of this accomplishment can be partially demonstrated.

Lay Programs: The actual audiences reached by individual physician-speakers between January, 1955, and April, 1956, is indicated in the following table:

<i>Date</i>	<i>Place</i>	<i>Attendance</i>
Jan., 1955	McLouth Schools	305
	Leavenworth Kiwanis Club	100
	Public Heart Forum, University of Kansas Medical Center	300
	Fairfax Optimist Club	60
Feb., 1955	Lawrence Business and Professional Women's Club	70
March, 1955	Parent-Teachers Association, Wyandotte County	100
	Jefferson County Kiwanis Club	50
	"Talk of the Town" TV program, estimate by station	400,000
	Valley Falls Rotary Club	25
	Homestead Country Club, Prairie Village	86
	DeSoto Rotary Club	35
	Parent-Teachers Association, Denton	100
	Bendena Community Meeting	75
	Troy SLK Club	35
	Atchison Rotary Club	70
April, 1955	Ottawa Lions Club	30
	Leawood Men's Club	35
	Miami County Medical Society	10
	Paola Rotary Club	65
May, 1955	Jefferson County Medical Society	5
	Ottawa Kiwanis Club	67
	Modern Women's Home Demonstration Unit	20
	Ottawa Rotary Club	61
June, 1955	Tonganoxie Kiwanis Club	24
	Vocational Advisory Council of Greater Kansas City	40
	Lawrence Kiwanis Club	100
Sept., 1955	Kansas City Kiwanis Club	80
Sept., 1955	Wyandotte County Annual Teachers Institute	346
	Johnson County Annual Teachers Institute	150
	Paola Annual Teachers Institute	50
	Lions Club, Paola	45



	Parent-Teachers Association, Noble Prentis Grade School	125
	Parent-Teachers Association, Emerson and Franklin Counties	100
	Phi Beta Pi Medical Fraternity, Lawrence	40
	LaSertoma Club, Lenexa	30
	Doniphan County Annual Teachers Institute	146
	Atchison County Required Teachers Institute	87
	Parent-Teachers Association, Atchison	100
	Douglas County Annual Teachers Institute	45
	Argentine High School Students	48
	Denton Schools	50
	Cushing Memorial Hospital Nurses	35
	Lowell and Progressive Clubs, Highland	35
	Home Demonstration Unit Meeting	18
Nov., 1955	TWA Management Club	200
	McLouth Rotary Club	30
	Roeland School	50
Dec., 1955	Atchison City Teachers	89
Jan., 1956	Lenexa Grade School Parent-Teachers Association	14
	Prairie Grade School Parent-Teachers Association	35
	Public Health Nurses of Johnson and Wyandotte Counties	13
	School Nurses	25
	Wathena Grade School Parent-Teachers Association	45
	Junction Grade School Parent-Teachers Association	125
Feb., 1956	Troy Men's Club	25
	Atchison County Council of the Kaw Valley Heart Association	50
	Bendena Community Meeting	70
	Highland First Nighters Club	25
	Heart Fund Campaign Workers of Leavenworth	70
	TOPS Club	20
	St. Agnes High School Parent-Teachers Association	50
March, 1956	Community Lecture Series	15
	Sunflower Parent-Teachers Association	40
	Fontana Consolidated Schools	60
	Lansing Grade School Parent-Teachers Association	32
	Mark Twain Parent-Teachers Association	75
April, 1956	Whitmore Grade School Parent-Teachers Association	40

This exceedingly heavy load of speaking was borne by 29 physician participants in our speakers' bureau, of whom 21 were practicing physicians in their respective communities and eight were from the Medical Center.

The audio-visual materials have been enthusiastically used by teachers. These materials consist of heart models, heart notebook sheets, wall charts, and films. Slightly more than 48,000 of these items were supplied by the heart association and used in the public and parochial schools in this nine-county area in the school year now closing. In addition, 5,000 special leaflets on heart disease (Now You Can Protect Your Child. Health Programs for the Parent-Teachers Association) for parents and teachers were distributed.

The national organization has prepared a full list of pamphlets, booklets, and other literature. Much of the merit of this literature lies in correlating it with a professional appearance. In the Kaw Valley area, this has been particularly demonstrated in the field of rheumatic fever prophylaxis. With our intensive speaking program, a large share of the mothers with children between 6 and 15 have been informed of the present recommendations concerning prophylaxis, and this information has been presented by physician-speakers in small groups supported by question and answer periods. To further extend the message concerning rheumatic fever prophylaxis, every physician in the nine-county area has been contacted and supplied with appropriate literature.

A glance at the list of the audience groups will also indicate that business and civic leaders have been reached by physician speakers. With this audience, the subject of coronary disease has been repeatedly stressed.

As a major effort, to be certain that a maximal audience had been reached, a live television program on the subject of coronary disease was presented from a regional studio with the medical school's dean as moderator.

In addition to the large audience reached by professional personal engagements, films on the cardiovascular system were shown 136 times and reached an audience of 6,826 people.

These statistics serve as evidence that the original purpose of the Kaw Valley Heart Association, to tell the people about heart disease, to explain to them effective measures of prevention, and to keep them familiar with current knowledge, is being met.

The office on the campus has served as central intelligence agency to which are addressed requests for speakers, reservations for films, and requests for literature. The daily correspondence and telephone calls confirm the fact that the association has become

identified in the minds of the public as their *source of health information*.

The organization of the Kaw Valley Heart Association was planned around an executive secretary, and the association was extremely fortunate in obtaining a person highly trained and skillful in the field of health education. Mrs. Margaret Treadwell, with a master's degree in health education from Harvard University School of Public Health, proved the ideal executive secretary.

The past presidents of the Wyandotte County Heart Association have been Mr. Blake Williamson and Mr. Harold McDaniel. The president of the Johnson County Heart Association during its year of existence was Mrs. Joseph Clifford. The first president of the combined heart association was Mr. Ray Evans. The second and incumbent president is Mr. Walter Ross. The officers of the Kaw Valley Heart Association for the next year, 1956-1957, are as follows: chairman of the board, Col. Norman W. Anderson, M.C., U.S.A.; president, Walter W. Ross; vice-president, Dr. Monti L. Belot, Jr.; secretary, William Bradford; treasurer, W. C. Hartley; chairman of the finance committee, John S. Kelly; chairman of the program committee, C. Chauncey Cox; chairman of the rheumatic fever subcommittee, Dr. Monti L. Belot; chairman of the school subcommittee, dean George Baxter Smith.

Although primarily developed as a teaching adventure, the Kaw Valley Heart Association has been loyally supported during the annual fund raising drive.

CAMPAIGN RECEIPTS

<i>Fiscal Year</i>	<i>Kansas State</i>	<i>Johnson County</i>	<i>Wyandotte County</i>	<i>Kaw Valley</i>
1950	\$14,083.54	\$ 84.05	\$ 190.06	
1951	20,312.85	122.51	2,720.66	
1952	22,154.91	31.00	891.70	
1953	26,805.84	17.50	1,615.00	
1954	51,077.08	6,030.69	2,135.01	
1955	72,342.66			\$14,140.75
1956 to date	120,000.00			33,840.01 (Estimated)

THE FUTURE

For the future, the intensive speaking program will be continued. In addition special efforts are being made to reach management and labor organizations. Day-long programs at the Medical Center for science and physical education teachers are scheduled for this year. Conducted tours through the Medical Center, demonstrating areas of cardiovascular research, are being utilized as a means of reaching the leaders in church, education, labor, and management. Four "Heart of the Home" work simplification programs have been presented, and two more are scheduled.

Chairman, Department of Medicine
University of Kansas Medical Center
39th and Rainbow
Kansas City 12, Kansas

Affording valuable coverage against the unpredictable cost of hospital care, the Blue Cross Plan of prepayment represents social thinking of the highest order. To provide for the health needs of the family, the basic unit in society, is one of the basic responsibilities of the bread-winner. At very nominal cost to him this has been made possible; its broad recognition by the more than 50,000,000 who are now enrolled affords eloquent testimony of its acceptance, especially when one realizes that its development took place in only 26 years.

Its significance to the people cannot be overestimated; to the hospitals which sponsor this great social movement, it serves in a very substantial manner as the means for providing comprehensive service so necessary for effective patient care.

*Rt. Rev. Msgr. Robert A. Maher, President
Catholic Hospital Association of the
United States and Canada*

PRESIDENT'S PAGE

DEAR DOCTOR:

This is the period of the year when we think of others. How do these suggestions sound as gifts?

For the very special "others" in your family—the life insurance policy your Society is offering to all members under age 70 without evidence of insurability at far below usual cost.

For the girls in your office—a Blue Cross-Blue Shield policy patterned just for doctors' offices, which will become available to you shortly after the first of the year—also through the efforts of your Society.

For the dependents of servicemen, you may now provide obstetrical and other care to the hospitalized patient under a new contract completed with the federal government.

As a service to everyone, you may safeguard the public health by aiding in the passage of a Healing Arts Act in this next legislative session.

So my wish for a Merry Christmas is a very personal one to each of you, your families, and to the assistants in your offices. May all the traditional holiday joys be yours in abundance, and may the new year bring you not only achievements but a multitude of opportunities for service.

Fraternally,

Clyde H. Miller M.D.

President

EDITORIAL COMMENT

Medicare

The Kansas Medical Society and Kansas Physicians Service entered into a contract with the Department of Defense and the Department of the Army for implementing the federal program of medical care for dependents of servicemen. The program is known nationally as Medicare.

The Kansas Medical Society, by action of its Council on September 30, 1956, and by action of the House of Delegates on October 28, 1956, authorized Dr. Clyde W. Miller, president, to enter into this contract in behalf of the Society. Dr. Francis T. Collins, president of Kansas Blue Shield, was similarly authorized to contract for Kansas Physicians Service, and on November 19, 1956, Lt. Col. W. F. Lawrence, M.S.C., contracting officer for the United States, signed the document making it effective. The closing date of this contract is June 30, 1957.

The contract contains 10 pages of provisions plus 29 typewritten pages of a joint directive for the implementation of the program, plus 11 pages called a Schedule of Administration, plus 6 pages called a Schedule of Allowable Costs, plus 5 pages of general provisions, plus 115 pages of fee schedule, plus Addenda 2 and 3 to the fee schedule. The document, therefore, is obviously too long to print here in its entirety but contains the following material.

It is estimated that \$75,000 will be obligated at this time, and the total cost of this contract through June 30, 1957, is \$250,000. As stated above, the contract is entered into by the Kansas Medical Society, Kansas Physicians Service as the fiscal administrator, and the United States of America.

The fiscal administrator shall supply physicians with informational material in order that they may keep fully informed of all policies and procedures of the program. The fiscal administrator shall receive and pay bills under this contract.

The Society shall "maintain appropriate medical committees or boards, where required, to review and consider all cases involving complaints, differences of professional opinion and misunderstandings; and advise and assist the Government on matters within the scope of the program. However, where such committee or board has no cognizance over the subject matter of a complaint or over the physician involved, the matter will be forwarded to the Contracting Officer for consideration."

The government will determine eligibility of dependents and shall issue appropriate identification forms. The program begins on December 7, 1956.

Of particular interest to physicians are the follow-

ing statements taken from the contract: "Physicians and dentists furnishing services under this contract will not be considered subcontractors."

"A physician shall have the right to decline to participate under this contract or to refuse any individual case without stating a reason therefor, and dependents shall have the privilege of choosing any physician who agrees to provide medical services in accordance with Article 5 hereof." That article relates to fees.

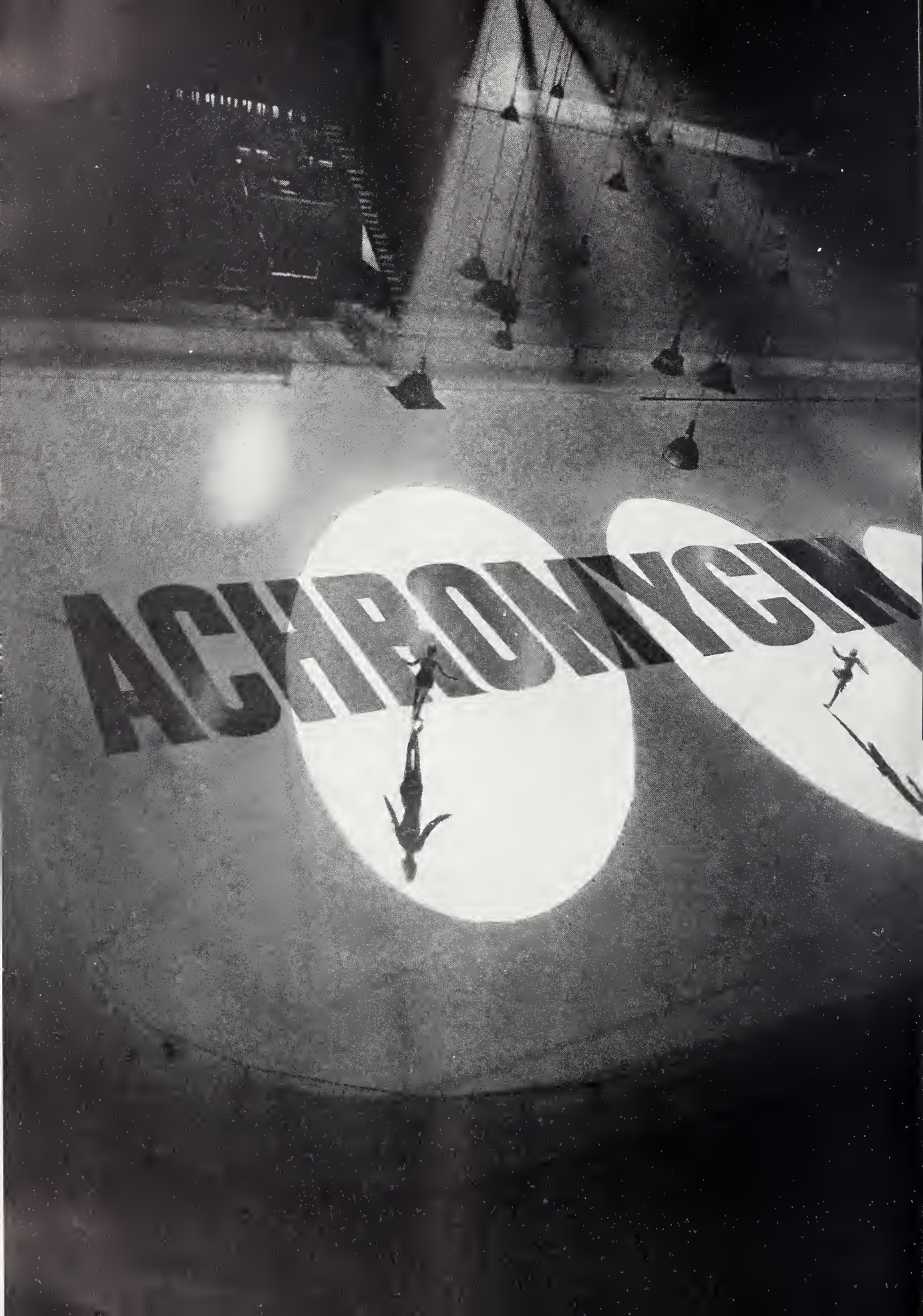
And while not specifically stated in the contract, a letter from Major General Paul I. Robinson, M.C., executive director, Office for Dependents' Medical Care, has informed the Kansas Medical Society that the fee schedule is one of "full service coverage" and except as authorized in the contract, the physician rendering care may not charge the patient in addition to the fee received from the government. This is a point of considerable significance and must be adhered to. Physicians who believe a specific fee to be inadequate should notify the Kansas Medical Society of that fact when submitting a statement. It is possible that adjustments can be made, but this is not the patient's problem.

The 11-page Schedule of Administration deals only with matters of interest to the fiscal agent. It gives the I.B.M. code numbers for all procedures to be used under this program.

The six pages of allowable costs list the items that may be charged to the government as operating expenses. They include such things as stationery, postage, travel expense in the carrying out of this contract, etc.

There are five pages of general provisions which are the standard items in every federal contract, requiring the fiscal administrator to keep records for six years, prohibiting the contracting agent from giving gratuities to government personnel, providing for non-discrimination in employment, and declaring that the government shall have the right to enter into contracts with other organizations or with other individuals for any of the services provided for in this contract, "provided that no such contract shall affect the rights or obligations of the parties to this contract."

The 115 pages of fee schedule, together with the two addenda, list some 1,500 procedures, only a few of which are applicable to this program. The complete fee schedule will be sent each member participating in this program and is far too long to print here. In general, however, it represents approximately the amount that physicians of Kansas might charge patients whose annual income does not exceed \$6,000. The government carefully stipulated this was not intended to be a luxury service but neither was it intended to be charity. Government officials repeatedly stated that even though the majority of these





ACHROMYCIN^{*}

Hydrochloride
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in the treatment of

genitourinary infections

UROLOGISTS report the decided advantages of oral efficacy, minimal side effects, and wide range antibacterial activity offered by ACHROMYCIN in the treatment of urinary tract infections.

Finland's¹ group of patients with acute infections of the urinary tract (principally *E. coli*) demonstrated excellent response, both clinical and bacteriological, following administration of tetracycline.

Prigot and Marmell² reported 49 out of 50 patients with gonorrhea showed a negative smear and culture on the first post-treatment visit. Purulent discharge disappeared in these patients within 24 hours after a usual 1.5 Gm. dose of tetracycline.

Trafton and Lind³ found tetracycline (ACHROMYCIN) an effective antibiotic for treating many urinary tract infections caused by both Gram-negative and Gram-positive organisms.

English, *et al.*⁴ noted that a daily dose of 1 to 1.5 Gm. of tetracycline resulted in urinary levels as high as 1 mg. per milliliter.

To suit the needs of your practice and to further the patient's comfort ACHROMYCIN is offered in a complete line of 21 dosage forms.



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AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK



^{*}REG. U. S. PAT. OFF.

References:

1. Finland, M., *et al.*: *J.A.M.A.* 154:561 (Feb. 13) 1954.
2. Prigot, A. and Marmell, M. *Antibiotics and Chemotherapy* 4:1117 (Oct.) 1954.
3. Trafton, H. and Lind, H.: *idem* 4:697 (June) 1954.
4. English, A., *et al.*: *idem* 4:441 (April) 1954.

patients would be in a relatively low income category, they want the fee schedule to represent amounts for which the physician would gladly perform the service. It is certain that not every member will agree to each fee as representing his usual charge, but after many hours of work on the part of the Kansas Medical Society Committee on Fee Schedule and a review by the Council, this schedule was adopted. Changes can be made, and the Society will welcome any suggestions concerning fees that are unrealistic.

The final item of the contract is a 29-page joint directive prepared by C. E. Wilson, Secretary of Defense, and Marion B. Folsom, Secretary of Health, Education, and Welfare. This contains the details of how this program will operate. Each participating physician will receive a copy of this directive, so only a few items will be listed here.

Dependents eligible for civilian medical care are the lawful wife, the dependent lawful husband, and children who are dependents of members of the uniformed services.

Dependents who are not residing with their sponsors have free choice between private medical care and care in uniformed services medical facilities. Dependents residing with their sponsors may be required in certain localities to go to service facilities except in the case of bona fide emergencies.

Medical care will be paid for dependents only during hospitalization for acute medical conditions, contagious diseases, and surgery for a period not to exceed 365 days hospitalization in semi-private accommodations. Services which may be performed outside hospitals are obstetrical and maternal care, any emergency prior to hospitalization, and accidents involving fractures. For the latter, \$75 may be allowed for diagnostic procedures prior to hospitalization and \$50 after hospitalization. There may also be other exceptions, but the directive says, "Although the Dependents' Medical Care Act provides primarily for professional services during hospitalization and does not permit medical care normally considered to be out-patient care at Government expense, certain limited benefits are authorized. . . ."

Not authorized at all is care for chronic diseases, nervous and mental disorders, elective medical and surgical treatment which, according to their definition is "medical or surgical care that is designed or requested by the patient which, in the opinion of cognizant medical authority, is not medically indicated; e.g. surgery solely for cosmetic purposes," domiciliary care, treatments or procedures normally considered to be out-patient care, and ambulance service.

The patient will pay a portion of the cost of hospital care, and in very rare instances such as home or office delivery in obstetrics, the patient will pay \$15 of the charges in connection with the delivery, if not subsequently hospitalized. Except for that,

" . . . schedules of allowances are to be used in full payment of bills presented by physicians and surgeons."

The directive also identifies a physician and surgeon as "a person who is legally qualified to prescribe and administer all drugs and to perform all surgical procedures."

American Association of Medical Assistants

An organization of special interest to physicians came into being on October 27, 1956, when 223 medical assistants, representing 16 states, adopted a constitution and by-laws for the American Association of Medical Assistants. The meeting was held in Milwaukee.

The decision to form a national organization was made a year ago when 75 medical assistants from 15 states met in Kansas City at the invitation of the Kansas Medical Assistants' Society. Each state represented there named one of its group to a committee which worked throughout the year on organizational problems. A copy of the proceedings of the first meeting was sent to each state for presentation to state organizations and sponsoring medical societies.

Miss Maxine Williams of Kansas City, who served as chairman of the group during the past year, was named first president of the organization. Mrs. Carmen Kline, also of Kansas City, was elected treasurer, and Mrs. Pauline Keller, Topeka, was chosen as a member of the board of directors and of the executive committee. All three are past presidents of the Kansas Medical Assistants' Society.

Other officers are: Mrs. Mary Kinn, Santa Ana, California, president-elect; Mrs. Marian Little, Cedar Rapids, Iowa, vice-president, and Miss Alice Budny, Milwaukee, recording secretary.

Soon to be announced are the names of six physicians who will serve as members of a committee to advise the assistants' organization. Assistants in each state will nominate physicians, and six of those so nominated will be chosen by the executive committee of the A.A.M.A.

The 1957 meeting of the organization will be held in San Francisco.

The purposes of the association, as expressed in the constitution, are as follows: "(1) To inspire members to render honest, loyal, and efficient service to the profession and to the public; (2) To strive at all times to cooperate with the medical profession in improving public relations; (3) To render educational services for the self-improvement of its members and to stimulate a feeling of fellowship and cooperation, and (4) To encourage and assist all unorganized medical assistants in forming state and local societies."

The Kansas Medical Assistants' Society was organized in 1940, so physicians here are familiar with the group. Through its Committee on Medical Assistants the Kansas Medical Society has advised on matters affecting membership, policy, projects, and programs. Physicians in this state have consistently approved and aided the group.

In some other states, however, such an organization is unknown, and a few physicians expressed a belief that assistants might be organizing for mercenary reasons. To refute that impression with finality, the new organization incorporated the following statement in its constitution: "It is not nor shall it ever become a trade union or collective bargaining agency."

Kansans justifiably feel that they have played an important part in organizing the A.A.M.A. Two physicians attended both the Kansas City and the Milwaukee meetings, Dr. Clyde W. Miller, Wichita, president of the Kansas Medical Society, and Dr. Murray C. Eddy, Hays, chairman of the Committee on Medical Assistants. Dr. Maurice Tinterow, Wichita, was also present in Milwaukee. Twenty-six Kansas assistants attended.

Federal Health Expenditures

Once each year the American Medical Association Washington office reports on federal health expenditures in all departments. Just received is a 16-page document with the health budgets for the fiscal year July 1, 1956 to June 30, 1957 listed in all categories of federal participation. Details may be obtained on any point by writing the Executive Office, but for this purpose a broad summarization will suffice.

The federal government is spending more for health this year than ever before. This budget, if you like big figures, is \$2,558,719,168, an increase of almost \$200 million over last year.

Perhaps figures mean more when they are broken down into smaller amounts like this—It will cost every man, woman, and child \$15.17 this year to pay just for federal health projects, an increase of \$1.78 over last year. If only wage earners are considered, the cost is \$38.72 or \$54.61 per family.

Most of the increase comes from additional expenditures for research, and of course much of this work has contributed toward our nation's high standards of health, but two and one-half billion dollars is not an insignificant figure even out of a \$61.2 billion budget, as the A.M.A. report points out. This health budget is a billion dollars greater than the total cost of running the Commerce Department. It is a half billion more than all Agriculture Department expenses and is six times greater than the budget of the Department of the Interior.

Leading the list is the Veterans Administration

with a budget of \$825,024,300. The excellent report breaks these main topics into many separate departments such as out-patient care, hospitalization, construction, etc., many of which will not be reported here. It may be of interest to note that out-patient care is reduced from last year, as is hospital construction, but that in-patient care in VA hospitals is higher. This is the largest single item in the VA health budget and includes the cost of operating 173 VA hospitals for an average 121,865 bed capacity. Less than one per cent of the total budget, under \$8 million out of more than \$800 million, is set aside for physicians under the home town care program.

Second is the Department of Defense with an estimated budget of \$790,105,000. This is \$28 million lower than last year, even with a new item of \$41 million for the Dependents' Medical Care Program, accomplished because of a more effective joint utilization program and reduced construction.

Third is the Department of Health, Education, and Welfare with an enormous increase to \$772,661,800 for this fiscal year. This is almost a 30 per cent increase, mostly accomplished by enlarging research programs. For example, the National Cancer Institute will receive \$48,432,000 this year as compared to \$24,828,000 a year ago. The National Heart Institute fared almost as well percentage-wise with a budget of \$33,396,000 as compared with \$18,778,000 last year. The Mental Health Institute had almost exactly the same figures as the Heart Institute. Arthritis research went from \$10 to \$15 million. The Neurological Diseases and Blindness Institute went from \$9 to \$18 million, and the Allergy and Infectious Diseases Institute was increased from \$7 to \$13 million.

There are other items of interest even though the figures may not be quite so dramatic. Look at the Poliomyelitis Vaccine Program which received 30 million last year. It is budgeted for \$23,600,000 for this fiscal year. Tuberculosis Control was raised a half million dollars over the \$6 million of the last report. Venereal Disease Control received an additional \$700,000 to \$4,195,000, and Communicable Disease Control has a half million more than last year at \$5,750,000.

There is a new item of \$1,376,000 for a National Library of Medicine. This was authorized by Congressional action which transferred the Army Medical Library to the Department of Health, Education, and Welfare. Also new is about \$2½ million for practical nurse training, and a \$9 million item entitled Disability Freeze Program which is the increase immediately expected under the amendments to the Social Security program that were passed by the last Congress.

Very briefly listing a few more major items from this report will show a 20 per cent increase in Civil Defense to \$49,810,000; \$31,525,000 for the Atomic

Energy Commission, \$8,000,000 for the National Science Foundation, and many other lesser amounts. There are 21 major departments listed with health programs, and their projects of course run into the thousands. For example, 38 separate divisions are recorded in the Department of Health, Education and Welfare alone.

COUNTY SOCIETIES

Dr. Charles S. Joss, Topeka, was installed as president of the Shawnee County Society at a meeting held at Topeka on November 5. His father, Dr. Chester E. Joss, who served as president 30 years ago, was one of the installing officers. Other officers now serving the society are: Dr. David E. Gray, president-elect; Dr. Clovis W. Bowen, vice-president; Dr. James A. McClure, secretary; Dr. Jack A. Dunagin, treasurer; Dr. John E. Crary, to board of directors; Dr. Otto L. Hanson, to board of censors, and Dr. G. Bernard Joyce, Dr. Chester M. Lessenden, and Dr. Ralph R. Preston to the medical service board. A plaque was presented to the retiring president, Dr. Clyde B. Trees.

"Recent Advances in Vascular Surgery" was the subject discussed by Dr. J. Maxwell Chamberlain, New York City, at a meeting of the Sedgwick County Society at Wichita on November 6. Dr. Chamberlain is associate professor of surgery at Columbia University.

Preliminary plans have been made for society sponsorship of a science fair for high school students in south central Kansas next spring.

Members of the Saline County Society were guests of the U.S.A.F. Hospital at Smoky Hill Air Force Base, Salina, in October. The program consisted of a film, "Medical Effects of the Atomic Bomb." At its November meeting the Saline County Society endorsed fluoridation of the Salina water supply.

Dr. Paul Schalekford, Tulsa, was speaker at a meeting of the Montgomery County Society at the Coffeyville County Club on October 17. He discussed common dermatologic conditions and new concepts of treatment.

A guest speaker, Mr. Joseph Cohen, addressed the Wyandotte County Medical Society in a joint meeting

with the Wyandotte County Bar Association at the Town House Hotel on November 20. The subject discussed was "The Middle East Crisis."

A meeting of physicians and Auxiliary members of the societies comprising the First District of the Kansas Medical Society was held at the Sabetha Country Club on October 30. Dr. Clyde W. Miller, Wichita, and Mrs. William J. Biermann, Wichita, presidents of the two state organizations, were guest speakers.

DEATH NOTICES

GEORGE E. BRETHOUR, M.D.

Dr. George Brethour, 72, a member of the Morris County Society who had practiced in Dwight for 47 years, died at a Junction City hospital on October 27. He had suffered a cerebral hemorrhage a few days previously. He began practice in Dwight in 1909, immediately after his graduation from Kansas Medical College, Topeka, and worked elsewhere only during World War I when he served in the Army Medical Corps. Dr. Brethour was honored by his community in 1949 when almost 4,000 friends gathered to do him honor, among them many of the 3,038 persons he had delivered. Among the survivors is a son, Dr. Leslie J. Brethour, Junction City.

FREDERICK WILLIAM O'DONNELL, M.D.

A physician who had been in practice almost 60 years, Dr. Fred O'Donnell, Junction City, died on November 6. He had suffered a stroke on October 11 while attending a patient in the Junction City Hospital.

Dr. O'Donnell was graduated from the University Medical College, Kansas City, in 1897 and practiced first in Bushton. He later took a year's graduate work at Columbia and then opened his office in Junction City. During World War I he served in the Army in this country and overseas.

In 1946, on the anniversary of his 50th year in practice, Dr. O'Donnell was honored by the Junction City and Fort Riley communities. One of the speakers on that occasion was Gen. Jonathan M. Wainwright.



"I present the subject of cancers for your consideration. It comes within the domain of surgery. Since our last meeting I have had an opportunity of examining some cases of cancer, both on the living subject and cadavera.

"What is the origin of cancer? Does the disease consist solely in a local change of structure, or is it the local determination of a general morbid condition of the blood, or are the blood and the tissue equally interested in its formation? It is not surprising that surgeons have come to regard cancer from the first as a constitutional or blood disease. Indeed it is no easy matter to account for all we observe in cancer without adopting some such view. On the other hand, there are many facts which oppose themselves to it, and there are other modes of accounting for some of these characters which most strongly support it. . . ."

"If cancer be a constitutional disease, we must strive to find some corrective to the constitutional taint. And we should try in that case to determine whether the local disease is the result of some error in the organizing or nutrient function of the tissues, or whether it is the actual deposit of some poison previously existing in the blood. Then we might have reasonable hope of being able to do what as yet has proved beyond our reach—to cure or even modify cancer by general treatment. But if cancer be, at any period of its existence, a purely local disease, we should hope that by earlier and more complete removal, better and more generally permanent results may be obtainable than we can at present boast of. Virchow and many German pathologists maintain that cancer is not to be regarded as a blood disease, although a constitutional tendency may exist. They claim that cancer and some allied diseases partake more of the nature of parasitic disease than of the results of previous blood poison. . . ."

"Let us consider some of those special characters which have led to so firm a belief in

the blood origin of the cancer. Perhaps that which seems to be the most conclusive evidence to the large majority of those who hold this view is the almost constant recurrence of the disease after removal. Entire and permanent immunity does occur, but it is rare. In such cases it would be said, first, that the blood poison having worn itself out, or been eliminated by the formation of a tumor, no further development took place when the local tumor was removed; or, second, that two conditions were necessary for the formation of cancer—one, the blood poison, the other a fit state of tissue in which it might manifest itself; and that a tumor having been removed, there remained no fit nidus for its reproduction.

"These cases of permanent cure after operation are, we may admit, exceptional. The more common event is that, after removal of a tumor, in favorable cases there is immunity for a longer or shorter period—some months or some years. Is the blood diseased during this time? Are the other tissues free from disease? It is most important here to consider the mode of recurrence of the disease.

"It is a recognized fact that cancer rarely returns either in an organ corresponding to its original seat, or indeed in any organ which is the usual seat of the primary disease. . . ."

"The influence of local condition must be at least more powerful than that of blood. So much is said and written about cancerous cachexia that cachexia comes to be regarded as a necessary associate of cancer. Hence we too frequently rely upon it as a means of diagnosis, and conceive that a disease cannot be cancerous because the patient's health is good, whereas, in reality, cancer, especially in early and middle life, fastens itself often upon those who are well nourished and florid, who seem the most healthy and so give promise of life."—Report of Committee on Surgery in *Transactions of the Kansas Medical Society*, 1872.

OFFICIAL PROCEEDINGS

A special meeting of the House of Delegates of the Kansas Medical Society was held at the Lassen Hotel, Wichita, on Sunday, October 28, 1956, at the call of the president, Dr. Clyde W. Miller, and with the approval of the Council.

Dr. Miller presided and asked and received approval of special rules for the meeting. Dr. A. W. Fegtly, sergeant at arms, announced the presence of a quorum, 64 delegates, 8 councilors, 4 past presidents, and 10 officers. Twenty-five visitors also attended.

A proposal to change the present Code of Ethics of the American Medical Association was first discussed. Kansas delegates were instructed to oppose changes in the code when they attend the A.M.A. meeting in Seattle, November 27-30, 1956.

Next on the agenda was the subject of medical care for dependents of servicemen. Dr. Miller explained Public Law 569 of the 84th Congress, which makes provision for such care, described the contract to be negotiated with the government, and outlined the fee schedule. The House voted to permit the president, with the advice of the Council, to use his best judgment in instituting and carrying out this program.

It was announced that the government apparently will not contract with the Kansas Hospital Association for hospital services under this program, after which the following resolution was unanimously adopted:

WHEREAS the federal government, in its effort to purchase medical and surgical care for dependents of servicemen in Kansas, is contracting with the Kansas Medical Society as the only body capable of making services of that type available under contract; and

WHEREAS the Kansas Hospital Association bears the same relationship to hospital services in Kansas as does the Kansas Medical Society to medical and surgical services in this state; and

WHEREAS the federal government in contracting for hospital care for dependents of servicemen is believed to be negotiating through an unrelated third party which has neither control over nor interest in nor obligation for hospitals or hospital care; and

WHEREAS such procedure clearly will not serve the best interests of those persons for whom the government feels obligated to purchase hospital care, be it therefore

Resolved that the Kansas Medical Society respectfully urges the Department of Defense, the Department of the Army, and such other agencies of the United States as may be involved to reconsider

their action and in purchasing hospital services for dependents of servicemen that they approach the Kansas Hospital Association.

The subject of legislation was next introduced. Dr. Lucien R. Pyle read a Basic Science Act which has been proposed for Kansas. The House voted to approve the act, as amended and as it may be further amended, so long as it is in keeping with the meaning of this proposal.

After a luncheon recess and the introduction of Dr. James A. McClure of Topeka, a newly appointed member of the Kansas State Board of Medical Registration and Examination, Dr. Pyle read a proposed Healing Arts Act. The House voted to approve this act as a part of the legislative policy of the Kansas Medical Society. In addition to formal discussions by Dr. J. D. Colt, president of the Kansas State Board of Medical Registration and Examination, by Mr. Blake A. Williamson, attorney for the board, and by Mr. Kirke W. Dale, attorney for the Society, there was informal discussion from the floor.

Dr. Miller, for himself and for the Society, expressed thanks to Dr. Pyle and his committee.

Dr. Thomas R. Hood, secretary of the Kansas State Board of Health, distributed copies of a proposed Narcotics Act. Mr. Oliver E. Ebel, executive secretary of the Society, briefly discussed a Commitment Law on which the Committee on Mental Health has been working. Dr. John L. Lattimore described a proposed Coroner Law.

After discussion of these matters the House authorized the president to proceed in his best judgment, to consult with those he feels may advance the principles advocated at the House of Delegates meeting, and to consult the Council if a change of policy should appear desirable.

A motion authorizing Dr. Pyle and his committee to meet with individuals and organizations as may be deemed of assistance was passed without dissent.

Dr. Miller reported that he had attended the organization meeting of the American Association of Medical Assistants in Milwaukee, October 26 and 27. The House authorized him to prepare a resolution endorsing the organization for presentation to the House of Delegates of the American Medical Association.

There being no further business, the meeting was adjourned.

Home accidents ranked second as a cause of death from accident in Kansas in 1955. Three hundred ninety-six persons lost their lives because of injuries received in their homes or yards. Falls caused the most deaths, and most of those occurred in persons over 65 years of age. Poisonings, fires, and explosions were other important causes of home deaths.

Tumor Conference

Malignant Melanoma of the Conjunctiva

Edited by **HOWARD P. FINK, M.D.**

Dr. Friesen (Moderator): A proper understanding of the unusual biologic characteristics shown by some malignant melanomas is important in their therapy and prognosis.

O. C. Chowning (Senior Medical Student): This patient is a 69-year-old white woman who entered this hospital on September 26, 1955, with a chief complaint of pain in her left eye and decreasing vision for several years. She had noticed pigmentation on the inside of the lower lid of her left eye for more than five years, and about five years ago she noticed that there was also some discoloration of the sclera, as well as a small growth in the lower conjunctival sac. Recently the pigmentation had increased, and the tumor had grown slightly. She was referred here by her local doctor after a biopsy had proved the growth to be a melanoma.

On admission, here her significant physical findings were limited to the left eye. A 12 x 8 mm. grayish, lobulated, pedunculated mass was noted in the lower conjunctival sac near the inner canthus. There was dark brownish pigmentation of the sclera, which extended a short distance onto the cornea. Slight enophthalmos and slight conjunctival injection and edema were noted. Visual acuity was decreased on the left. She could see well with correction but could not read fine print without glasses. X-ray examination of the chest was normal.

Dr. Friesen: Where did this pedunculated mass arise?

Mr. Chowning: Apparently from deep in the lower sulcus, near the orifice of the lacrimal duct.

On October 4, exenteration of the eye was performed; the entire contents of the left orbit were removed and a split thickness skin graft was applied.

Dr. Friesen: Dr. Mantz will discuss the findings on the surgical specimen.

Dr. Mantz: Histologically, this is a rather characteristic pigmented malignant melanoma. Mitotic figures are not common. The overlying conjunctiva is deflected upward by the tumor and is focally ulcerated.

In the opposing palpebral conjunctiva there is a

second lesion which is composed, for the most part, of heavily pigmented spindle-shaped cells beneath the epithelium; there are associated alterations within the epithelium itself, consisting of many foci of cells which often are pigmented and are large, round, and loosened. No malignant changes are present in this lesion.

A third pigmented tumor, similar to this second one, is present in the bulbar conjunctiva near the limbus. Thus this patient had compound nevi of the bulbar and palpebral conjunctiva as well as the malignant melanoma in the lower conjunctival fornix. It was thought clinically that the melanoma in the fornix extended over the limbus, but histologically this is not so; the physical appearance of extension was due to edema of the conjunctiva at the limbus, plus the presence of the nevus in this area.

Dr. Friesen: Do you think her melanoma originated as a nevus which underwent malignant change?

Dr. Mantz: Quite probably it did, considering the close spatial relations of these three tumors, but it is impossible to say with certainty.

Dr. Friesen: Do melanomas of the eye ever involve the retina?

Dr. Mantz: No, not primarily. They originate usually from the uveal tract. Conjunctival melanomas, however, are practically identical in their behavior with intraocular lesions.

Dr. Larry Calkins: Pigmented nevi of the conjunctiva are fairly common. Most of them have a junctional component and hence are potentially malignant, yet malignant transformation is rare. Malignant melanoma of the uveal tract, on the other hand, is the commonest intraocular tumor of adults. Recogni-

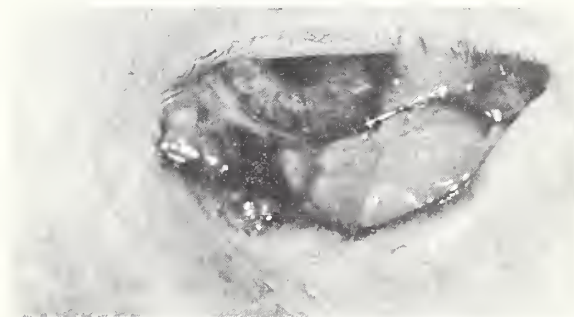


Figure 1. Melanoma of the lower conjunctival sac.

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Fink is a Trainee of the National Cancer Institute.

tion while the tumor is still in a resectable stage depends upon the ophthalmoscopic finding of a retinal detachment with a yellow, brown, or black tumor mass bulging up beneath it.

Dr. Friesen: Dr. Robinson, is this woman's disease serious?

Dr. Robinson: Yes, that is why a radical exenteration was performed. The operation may well prove to have been futile, though surgery was certainly indicated.

Any melanoma is of serious import. Perhaps those with the best prognosis are the ones that originate within the eye, but certainly this woman stands a chance of having some real difficulty in the future. One can never foretell what a melanoma is going to do. To advise the patient or his family what the outcome will be is more difficult with melanoma than with any other tumor. There are many reports of melanomas, most of which originated in the eye, which have remained dormant for more than 20 years. Sometimes even proved metastases will lie quiescent for many years, and then rapidly progress, for no apparent reason, to a fatal termination.

In general, melanomas arising in the skin of the

head and neck have the best prognosis of all melanomas of the skin. Those of the upper extremity have the next best prognosis, those of the trunk a poor prognosis, and those of the lower extremities and genitalia a bad prognosis. Melanomas originating in the mucous membranes have been universally fatal.

Before any surgical procedure for melanoma is undertaken, one should certainly examine the regional lymph nodes, and also the next group of nodes beyond the area, in the direction of the lymphatic drainage. The liver should be carefully palpated, and a chest x-ray should always be taken to see whether the lungs are clear before surgery is contemplated.

Dr. Friesen: If this woman does develop metastases, where would you expect them to appear first?

Dr. Robinson: The lungs, I think. Repeated survey films of the patient's chest should certainly be taken. It has been estimated that about 60 per cent of metastases from a melanoma are blood-borne, and a good share of this 60 per cent will appear in the lungs. However, one must not forget that the local lymphatics are likely to be involved also. To do the best type of surgery for cure of a melanoma, one frequently must excise the local lesion and the regional lymph nodes with the intervening tissues in continuity. Metastases from a melanoma of the skin surface will often crop up as nodules along the course of the regional subcutaneous capillaries and lymphatics. Even in benign nevi the tumor cells lie in close approximation to the subepithelial vascular plexus. Such satellite subcutaneous nodules are not likely to occur in this patient, since the excision was extensive. However, in general it is important that all the skin of the patient's body be carefully inspected and palpated for subcutaneous nodules, because sometimes the metastatic process will show a bizarre pattern with spread to distant subcutaneous locations where one would scarcely expect to find a metastatic tumor. Presumably such distant foci arise by hematogenous spread of the tumor. Biopsy of such a nodule may be necessary to prove what it is.

Dr. Friesen: Lund and Ihnen¹ treated one series of cases of melanoma of the skin by wide excision with removal of regional lymph nodes if the nodes were enlarged. They regard palpable enlargement of the nodes as good evidence of metastatic involvement. They felt that regional node dissection should be done prophylactically, even in the absence of demonstrable metastases. If lymph node metastases were present at the time of the original operation, there was a 14.8 per cent five-year survival rate. If the lesion had not metastasized to the lymph nodes, the five-year survival rate was about 40 per cent. The best figures are those of Dr. Meyer, who reports 52.5 per cent five-year survival rates with radical



Figure 2. Sagittal section of the excised eye. The solid arrows indicate the malignant melanoma, the open arrows the compound nevi in bulbar and palpebral conjunctiva. The cleft along the posterior border of the melanoma is an artefact.

excision of the primary lesion and prophylactic node dissection.²

Dr. Mantz: Melanomas of the eye, including those of the conjunctiva, are a little more predictable on the basis of their histology than are melanomas of the skin. The American Registry of Ophthalmic Pathology has carefully tabulated and studied a large number of cases and has found that if the growth is primarily a spindle cell variety, the prognosis is relatively better; if it is epithelioid, the prognosis is somewhat worse. If both cell types are present, as in this case, the prognosis is midway between the two. I believe that the Registry statistics on mixed types of melanomas show about a 45 per cent mortality in a five-year period, although, as Dr. Robinson has mentioned, one cannot predict how any one particular lesion will proceed. If the tumor extends posteriorly, the prognosis is much worse than if it extends anteriorly over the cornea. In this case, there has been considerable posterior extension.

Dr. Friesen: In summary, then, this woman has been well treated according to present-day surgical concepts; but still we can offer her no better than a 40 per cent chance of living five more years.

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PHYSICIANS' ACTIVITIES

Dr. David Lukens, Hutchinson, addressed the Kansas Society of Medical Technologists on the subject of radioisotopes at a meeting held in Hutchinson on October 22.

Dr. Karl A. Menninger, Topeka, has been named "Man of the Year" by Phi Beta Pi medical fraternity. The entire November issue of the fraternity magazine was devoted to Dr. Menninger.

New officers of the Kansas Local Health Officers Association, elected at a meeting in Emporia on October 26, are: president, **Dr. M. Leon Bauman,** Wichita; president-elect, **Dr. M. S. Carney,** Manhattan; secretary-treasurer, **Dr. C. H. Murphy,** Topeka.

Dr. Clyde W. Alexander, Kansas City, announces that his son-in-law, **Dr. Arthur P. Taliaferro,** is now associated with him in practice. Dr.

Taliaferro was graduated from Meharry Medical College in 1954 and served his internship in Washington, D.C.

A discussion on heart disease was presented by an El Dorado physician, **Dr. Ralph J. Metcalf,** at a recent meeting of the Butler County Medical Assistants Society.

Dr. Curtis A. Nystrom, Cawker City, has announced plans to be in Osborne for evening practice on certain week-day nights.

A feature story about **Dr. Andre Baude,** Topeka, who practiced in France before World War II and served in the French army during the war, was published in the *Topeka Daily Capital* on October 21.

Dr. Robert A. Dobratz, who formerly practiced in Chetopa, is now practicing in Beloit.

Dr. Roy A. Lawson, Jr., superintendent of the State Tuberculosis Hospital in Chanute, was guest speaker at a Parent-Teacher Association meeting in Oswego recently. He discussed tuberculosis, its causes, and treatment.

The American College of Surgeons has announced induction of the following Kansans as fellows: **Dr. Marmaduke D. McComas, Jr.,** Concordia; **Dr. William T. Wilkening,** Fort Scott; **Dr. John I. Waller,** Halstead; **Dr. Robert M. Brooker,** Topeka; **Dr. Cletus B. Boeshart,** Wadsworth; **Dr. Albert C. Hatcher,** Wellington, and **Dr. Edward X. Crowley,** Wichita.

Governor Fred Hall has announced the appointment of **Dr. Andre Baude,** Topeka, to the Advisory Commission on the Tuberculosis Sanatorium at Norton.

Dr. Ralph S. McCants, who recently completed a five-year residency in pathology at the Mayo Clinic, has joined the staff of the Lattimore-Fink Laboratory, Topeka. He is a graduate of the University of Oklahoma School of Medicine and served his internship in Kansas City, Missouri.

A native Kansan who has been practicing in San Diego during the past year, **Dr. George C. Steinberger,** has opened an office in Abilene. He was graduated from the University of Kansas School of Medicine in 1950 and served a surgical residency at the Veterans Administration Hospital in Des Moines.

Dr. John W. Hertzler, Newton, is heading the Harvey County committee working to promote a watershed treatment on the Little Arkansas River.

A feature story about **Dr. James G. Stewart**, retired Topeka physician, was published in the *Topeka Daily Capital* for November 11.

Dr. Henry H. Haerle, Marysville, announces that **Dr. John R. Warren** is now associated with him in practice. Dr. Warren is a graduate of the University of Kansas School of Medicine and recently completed his internship at Cook County Hospital in Chicago.

The Hertzler Clinic, Halstead, announces that **Dr. Robert B. Young**, who was recently released from the Army Medical Corps after service in Germany, is now a member of its staff. He is a graduate of the University of Kansas School of Medicine.

Dr. Robert W. Wright, Kansas City, has been installed as chairman of the advisory council to the St. Margaret's Hospital School of Nursing.

A feature story about **Dr. Alpha D. Updegraff**, Valley Center, was published in the *Wichita Eagle* for November 9.

Dr. Homer B. Russell, Great Bend, recently became a diplomate of the American Board of Surgery.

Dr. Chauncey G. Bly, associate professor of pathology and oncology at the University of Kansas School of Medicine, participated in the International Symposium on Approaches to the Quantitative Description of Liver Function at the U. S. Naval Radiological Defense Laboratory, San Francisco, October 30-November 2.

More Health Insurance Coverage

Benefit payments designed to help people pay hospital and doctor bills are running 20 per cent higher this year than last, the Health Insurance Council announced recently in issuing the findings of its tenth annual survey of the extent of voluntary health insurance coverage in the United States. As of July 31, 1956, the council estimates that some 110 million persons were covered by hospital insurance; 94 million had surgical protection; 58 million had regular medical expense coverage, and seven million were insured against major hospital and medical expenses.

The Committee on Prepayment Medical and Hospital Service of the American Medical Association's Council on Medical Service contributes information on various programs sponsored or approved by medical societies. The entire survey brings together Blue Shield figures reported by medical society plans as well as figures of independent plans, Blue Cross, and plans underwritten by insurance companies.

Some highlights of the survey as of the end of 1955:

1. Number of persons insured against hospital expenses increased by 6.1 per cent; surgical insurance up 7 per cent; regular medical expense insurance gained 17.5 per cent; major hospital and medical expense insurance increased 134.5 per cent.

2. Benefits for hospital expense still occupied top spot in American health insurance program—59,645,000 persons held policies from insurance companies; 50,726,000 enrolled by Blue Cross-Blue Shield; 4,530,000 covered by miscellaneous plans.

3. Growing public awareness of the cost of catastrophic illness prompted the sharp rise in the number of persons covered by major hospital and medical expense insurance. Of the 5,241,000 persons covered at the end of 1955, 4,759,000 had protection through their place of employment while 482,000 were insured through individual and family plans.

4. Protection to help meet the expense of surgical care was provided by private insurance companies to 56,645,000 persons; by Blue Shield-Blue Cross plans to 39,165,000, and by other types of plans to 4,340,000.

The Health Insurance Council is a federation of leading insurance associations. Its report probably will be available in pamphlet form later this fall.

Medical School Expansion

For the seventh consecutive year, the 1955-1956 enrollment in medical schools of the nation reached an all-time high with 28,639 students in the 76 four-year schools and six schools providing the first two years of medical training. The entering class of 7,686 was also the largest on record.

Expansion in the various phases of medical education is expected to continue. Classes scheduled for graduation during the next few years will be larger than the 1956 class. In addition, seven more schools will be graduating physicians by 1963.

However, before most of these physicians can begin practice, they will be drafted into military service. For example, 80 per cent of the 6,845 members of the 1956 class were liable for military service either immediately after graduation or after completion of internship.

Myxedema in Hyperthyroidism

Report of a Case and Review of the Literature

JOHN E. OLSON, M.D., *Cooperstown, New York*

The term myxedema is derived from the Greek words for mucous and swelling and literally means mucinous edema. It was first proposed and described by Ord in 1878 in conjunction with case presentations of generalized myxedema of hypothyroidism.²⁹ Since that time it has been used frequently, and often mistakenly, to signify hypofunction of the thyroid gland. Therefore, it appears somewhat paradoxical when one realizes that myxedema may also be a localized manifestation of hyperthyroidism.

This curious entity of localized myxedema, which is seen only in association with hyperthyroidism, was apparently first reported by Hektoen in 1895.¹⁷ Until recently it has been thought to be a condition of rare occurrence.

To date there is no term by which this entity is universally recognized. Due to its peculiar characteristics, it has been called localized myxedema, localized pretibial myxedema, pretibial myxedema, localized solid edema of the extremities, myxedema circumscriptum thyrotoxicum, and others. The first of these appears to be the most appropriate name.

CASE REPORT

H. R., a 41-year-old Negro male, was first seen at the University of Kansas Medical Center in February, 1953. He presented a seven-month history of progressive nervousness, excessive sweating, heat intolerance, palpitation, mild exertional dyspnea, weight loss, increasing prominence of the right eye, and intermittent swelling of the legs and ankles that diminished at night. The remaining history was non-contributory.

Examination revealed a well developed Negro male who was moderately nervous but in no acute distress.

Blood pressure was 135/75, pulse 105, temperature 98.6 degrees F., and weight 158 pounds. Other significant physical findings were: a mild right unilateral exophthalmos, moderate diffuse enlargement of the thyroid, excessive body sweating, a fine tremor of the hands, and elevated scar-like lesions on the

anterior aspects of both lower legs. No mention was made of edema.

The radioactive iodine uptake was 52 per cent, and the protein bound iodine level was 7.8 gamma per cent. Electrocardiogram and all other routine laboratory results were within normal limits.

The diagnosis of hyperthyroidism was made, and the patient was treated with 10 millicuries of radioactive iodine. Following this he became asymptomatic and in June, 1953, a radioactive iodine uptake of 23 per cent was consistent with a euthyroid status.

The patient was not seen again until two years later, in July, 1955. At this time he was hospitalized with a chief complaint of a hard swelling of the legs, feet, hands, and fingers.

History revealed that leg edema which was present during his state of thyrotoxicosis did not disappear after treatment. On the other hand, it gradually increased in severity and receded less at night as time passed. Accompanying this change was a thickening, roughening, and increased pigmentation of the overlying skin. As the process advanced the patient specifically noted that it was becoming different from "dropsy" in that "it would no longer dent." The process was one of a continuous state of progression until the time of his admission. The only accompanying symptom was that his legs were "harder to keep warm in cold weather."

The associated swelling of the hands and fingers had become apparent only within the previous two months. The formation of this edema was similar to that of the legs but without the overlying skin changes. History also disclosed that clubbing of the fingers had developed at some time within the past two years.

There were no signs or symptoms of thyrotoxicosis, hypothyroidism, or intercurrent disease. The pertinent physical findings were as follows: blood pressure 120/80, pulse 84, temperature 98.6 degrees F., and weight 170 pounds.

There was a moderate degree of exophthalmos on the right. The thyroid was not enlarged. A grade one high pitched systolic murmur was localized over the base of the heart. A symmetrical, brawny, non-pitting edema involved the proximal fingers, hypothenar regions, and the dorsum of both hands. There was also moderate clubbing of all fingers.

His legs and ankles were diffusely swollen with a

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. Dr. Olson is now serving his internship at Mary Imogene Bassett Hospital, Cooperstown, New York.



Figure 1. The lower extremity lesions of localized myxedema.

solid non-pitting edema (Figures 1 and 2). This process, which began about 10 centimeters below the knees, was most marked over the pretibial area. However, it also extensively involved the medial and lateral aspects of the lower legs, extended down and around the ankles, and diminished gradually over the dorsum of the feet. Here it gave the appearance of being limited by the pressure and boundaries of the shoes. The overlying skin was diffusely thickened, indurated, deeply pigmented, and of uneven contour. This had a coarse orange-peel appearance and the consistency of thick, hard leather. The previously noted scar-like lesions were especially infiltrated and presented themselves as discrete raised nodules.

The involved areas exhibited no deviation from normal in regard to skin temperature, degree of sweating, or sensory perception. The remaining points of the physical examination were noncontributory.

Laboratory investigations disclosed an erythrocyte sedimentation rate of 24 mm. in one hour. The electrocardiogram showed a prolonged P-R interval compatible with a first degree heart block. The protein bound iodine was 6.5 gamma per cent; the radioactive iodine uptake was 24 per cent; and the basal metabolic rate was plus one per cent. The complete blood count, non-protein nitrogen, serum proteins, liver function tests, and both acid and alkaline phosphatase were normal. The blood serology, sickle cell preparation, L.E. cell phenomenon, and congo red tests were all negative.

The only roentgenologic abnormalities were the following as interpreted by the radiologist: "The thickened proximal phalanges and well developed terminal tufts in addition to the conspicuous margins of the bodies of the vertebrae in the thoracic and lumbar levels are indicative but not diagnostic of acromegaly." X-rays of the skull, feet, and legs were normal.

A biopsy was taken and histologic examination of



Figure 2. The lower extremity lesions of localized myxedema.

the skin revealed features of localized myxedema (Figures 3 and 4). The epidermis was normal except for a mild degree of hyperkeratosis. The dermis appeared grossly thickened and edematous. In the deeper papillary and superficial reticular layers this edematous process was observed as a striking picture of fragmentation and wide separation of the collagenous fibers by the interspersation of a large quantity of metachromatic staining mucoïd substance. Concentrated within this material were greatly increased numbers of mast cells which also exhibited metachromatic staining. These cells were relatively scarce in the more normal areas of the skin. Conspicuous because of its sparsity was the elastic tissue which was observed only as fragmented shreds scattered in no arranged pattern throughout the entirety of the dermis. Especially noticeable was the virtual absence of elastic tissue in the walls of the small arteries in the skin. Otherwise the blood vessels were normal except for a mild perivascular lymphocytic infiltration. There was no evidence of lymphatic stasis. The dermal appendages were not unusual.

The first treatment attempted was the local injection of hyaluronidase into the myxedematous lesions on the leg. On each of six consecutive days, 1500 turbidity reducing units of this enzyme were mixed with 250 milliliters of 2½ per cent dextrose in water and allowed to infiltrate by intradermal clysis



Figure 3. Photomicrograph (X 48) showing the dermal changes in localized myxedema.

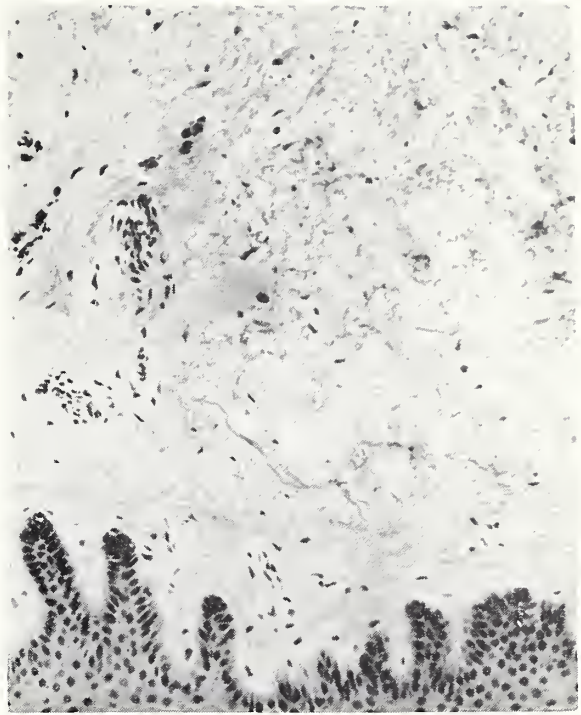


Figure 4. Photomicrograph (X 180) showing the dermal changes in localized myxedema.

into the involved areas. This caused the edema to become soft and pitting. However, within a few days after discontinuing such injections the lesion reverted to its original state. No adverse effects accompanied this procedure.

The remaining modes of therapy were instituted in an attempt to suppress the activity of the anterior pituitary gland. The first of these, the administration of exogenous thyroid extract, failed to give the desired result as measured by an initial control and a subsequent radioactive iodine uptake by the thyroid gland. The other method consisted of irradiation of the pituitary gland. This was given in divided doses to four portals over a period of 16 days to constitute a total concentration of 1500 r at the hypophyseal site. There were no side effects from this procedure except for the temporary epilation of a small area.

The results of this treatment cannot as yet be fully evaluated. Nevertheless, when the patient was last examined, five months after dismissal, the solid swelling of the fingers and hands had diminished considerably. Although there was found to have been no perceptible regression of the lower extremity lesions, further progression of these had apparently been interrupted by the irradiation.

In summary, this represents a case of localized myxedema which probably had its beginning during the toxic phase of hyperthyroidism. However, it was

not recognized as such at that time. Then after elimination of the thyrotoxic state the process went on to manifest itself in a severe form on the lower extremities. This was subsequently followed by involvement of the upper extremities which still presented an early lesion when the patient finally sought medical aid. The syndrome was then treated with satisfactory results by pituitary irradiation after failure with trials of thyroid extract and hyaluronidase therapy.

DISCUSSION

Clinical Features: Localized myxedema develops only in association with hyperthyroidism and may occur either in the toxic phase or following treatment of the disease. It bears no relationship to generalized myxedema of hypothyroidism except for the similarity of histologic features and the fact that both may develop simultaneously in a patient who has been overtreated for thyrotoxicosis. However, it can be distinguished in this latter instance in that generalized myxedema responds remarkably upon the administration of thyroid extract whereas this disorder is not affected.^{7, 38}

This syndrome is nearly always limited to a course of thyrotoxicosis in which true exophthalmos is a feature. It is seen with especial frequency in patients with progressive malignant exophthalmos.³ The clinical progression of these entities is practically identical.⁷ Their onset may be simultaneous and equally insidious. Both may develop during active thyrotoxicosis but appear more commonly and develop more rapidly after treatment. Both may persist for months or years, but their activity is often self limited. Spontaneous regression, which is inconstant and unpredictable, has been observed with each disorder. Furthermore, each may appear in its most severe form or exacerbate after the onset of the climacteric in women and in the decade following in men.²³

The coexistent development of clubbing of the fingers and localized myxedema, as in the case presented, has been a less constant feature described by a number of authors.^{18, 23, 33}

Site of Involvement: This entity has often been called pretibial myxedema because of its predilection for this region. However, it should not be overlooked that the site of involvement is not only this area but frequently includes the posterior aspect of the calf, the ankle, and the dorsum of the foot. Less commonly it is seen in its typical form on the arms and hands, and, more rarely, on the face, eyelids, and scrotum.^{5, 20, 23} For this reason localized myxedema is a more appropriate term.

Clinical Progression of the Lesion: The clinical appearance of this syndrome in the case presented is similar to typical descriptions in the literature. So described, this represents an advanced stage of a

process which is often unrecognized and remains undiagnosed until such extensive changes appear. Not until recently has the progression of the lesion from its earliest to advanced forms been recognized.

Initially it may be manifest only by a slight pigskin or orange-peel appearance of the skin. A mild diffuse swelling of the involved part then appears. At this time the process is still easily reversible and reveals hydrostatic features of pitting when adequate pressure is applied. It is symmetrical in distribution and ordinarily first involves the skin of the lower and anterolateral aspect of the leg just above the area constricted by the shoe. The inferior margin is usually well defined while the upper margin gradually spreads toward the knee. Later, as the process advances, the pretibial area usually becomes the most extensive site of the lesion.

Color changes of the skin sometimes develop but are often slow to appear.²³ The areas are initially normal in color but are later replaced by a yellowish tinge which gradually progresses to a faint erythematous blush. This may subsequently evolve into a pink and occasionally a reddish cyanotic or brown color depending on the melanin content of the skin. As progression continues the edema becomes increasingly more solid and difficult to indent with pressure. Then either firm circumscribed raised plaques develop and may later expand and coalesce, or the entire infiltrated area may gradually evolve into an irreversible non-pitting leathery edematous process.

The accumulation of this edema in the less commonly affected areas of the body usually appears later in the course of the disease; however, the genesis is similar to that described above except that it rarely reaches such advanced stages.

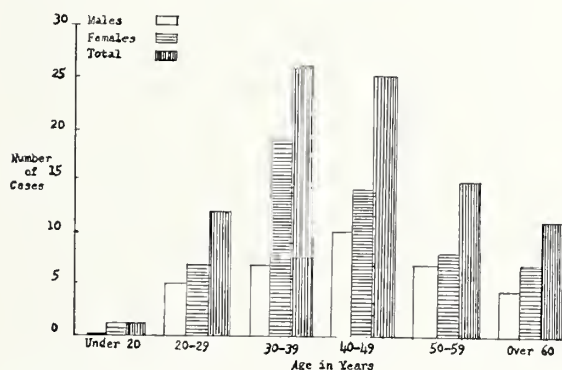
Symptomatology: The lesions of localized myxedema are commonly asymptomatic. However, patients occasionally complain that the areas have an itching or tingling sensation or that they are cold in winter and warm in summer. Rarely they become so extensive as to produce elephantastic lesions about the feet which, because of their massiveness, are of considerable inconvenience to the patient.³⁹ Nevertheless, in the absence of thyrotoxicosis or exophthalmos as the presenting complaint, most patients seek medical advice because of curiosity or aesthetic reasons.

General Incidence: This syndrome was once thought to be exceedingly rare and as few as 87 cases had been reported in the literature by 1952.¹⁶ Apparently it is not so rare as this would indicate since it has been reported to occur in conjunction with 1.6 to 3 per cent of all cases of hyperthyroidism.^{40, 45} Furthermore, upon analysis of 150 case records of patients with hyperthyroidism recently seen at the University of Kansas Medical Center,

descriptions typical of localized myxedema were found in six, constituting a 4 per cent incidence. The diagnosis of the condition was made in three of these and was suspected in one other; in the remaining two no comment was made concerning the process.

There was no follow-up data on many of the patients as they were seen in this hospital only at the time of therapy and were then released to the care of their local physicians. Consequently, in light of its more common occurrence after treatment, one would expect to have found an even higher incidence of localized myxedema had there been more complete records available.

Sex and Age Incidence: There are no conclusive reports concerning the sex and age incidence of this syndrome. Trotter and Eden observed that it is more common in women than in men in a ratio of 1.8 to 1.0. This is identical to that shown in Graph 1. Others feel there is equal occurrence in both sexes.^{3, 23} Age distribution is equally indefinite. However, upon analysis of many of the cases reported, the peak incidence appears to lie between the ages of 30 and 50 years which is similar to that of hyperthyroidism in general (Graph 1). Although this data may indicate a trend, it is evident that a larger and more correlated series must be investigated before statistically correct conclusions can be drawn in regard to age and sex distribution.



Graph 1. Number of males, 32; number of females, 58; ratio, 1.8 to 1.

Histologic and Biochemical Correlation: The histologic features of localized myxedema in the case presented are similar to those described by others.^{1, 22, 23, 45} One exception is the virtual absence of elastic tissue in the walls of otherwise normal skin arteries. This may well be an incidental and insignificant finding.

The characteristic muciform substance in the corium, which constitutes the edema in this entity, merely presents an exaggerated picture of that seen in generalized myxedema of hypothyroidism.^{11, 45} The

metachromatic staining properties of this material indicate that it is mucopolysaccharide in nature.²² This has proved to be true as shown by biochemical analysis whereby this substance has been separated into two fractions identified as hyaluronic acid and chondroitinsulfuric acid.*^{43, 44} These fractions are present in normal skin but have been shown by Watson and Pearce to be increased ten and six times respectively in localized myxedema. The capacity of such increments to produce skin changes in this syndrome is understandable in light of the following.

These mucopolysaccharides are lyophilic colloids which polymerize with water to produce large molecular structures that result in an aqueous emulsion of extremely high viscosity.²⁵ When this is present in the interstitial spaces in normal quantities it apparently merely aids in the cementing action of the intercellular substance. However, as the concentration of the lyophilic colloids increases, more water is bound in the tissue spaces and edema formation becomes evident. As this process progresses, the resulting edema gradually becomes more viscous and slowly evolves into the characteristic solid non-pitting lesion of this syndrome.

Etiology and Pathogenesis: Many theories have been advanced to explain the etiology and pathogenesis of localized myxedema, but none are completely substantiated.^{6, 42} Nevertheless, most of the available evidence indicates the basic pathologic physiology lies in a dysfunction of the anterior pituitary gland. This thinking is largely a product of the close clinical correlation of this syndrome to exophthalmos, which is often attributed to a hypersecretion of thyrotropin (T.S.H.) by the pituitary. However, considerable evidence has been collected recently to indicate the existence of an anterior pituitary exophthalmos producing factor (E.P.F.) or "collagenin" which is closely allied and chemically related to, yet a distinct principle from, thyrotropin.^{8, 12, 19, 21, 23, 37} This factor, according to Levitt, is tropic to all collagen ground substance of the body. Therefore, in some way it causes the excessive accumulation of the lyophilic mucopolysaccharides in retro-ocular tissue as well as the skin. Thus, in pituitary hyperactivity high levels of E.P.F. may be present and give rise to features of localized myxedema and exophthalmos at the same time excess T.S.H. is provoking the thyroid to induce a state of thyrotoxicosis.

Assuming the closely allied production of E.P.F. and T.S.H., the sudden eradication of a thyrotoxic state would, by diminishing the suppressor effect of

* The author conservatively identifies this second factor as chondroitinsulfuric acid and states "The possibility of its being mucoitisulfuric acid or some other unrecognized acid mucopolysaccharide must be conceded."

the thyroid on pituitary activity, result in a further increased production of the two hormones. Now lacking sufficient target organ (the thyroid) to produce toxic symptoms, the excess T.S.H. would merely be excreted. At the same time, however, the elevated E.P.F. may lead to further collagen change and exacerbate the pre-existing or initiate the new development of localized myxedema and/or exophthalmos. Hence, this would explain the development or progression of these two entities in post-treatment patients who actually have normal, or less than normal, function of the thyroid gland.

Another factor that may contribute to the proposed pituitary basis of localized myxedema is the observation that it may suddenly increase in severity during a period of relative gonadal or adrenal insufficiency.²³ Either of these conditions would theoretically result in less suppressor effect on the pituitary, allow it to be thrown into a state of hyperactivity, and thereby result in increased E.P.F. secretion.

Still remaining unanswered is the method by which the E.P.F. or "collagenin" mechanism acts locally to give rise to the increased mucin content of the ground substance. As stated previously, chemical analysis has shown this material to consist of two fractions, hyaluronic acid and chondroitinsulfuric acid. The former has received the most attention, and it has been suggested there exists an imbalance between this fraction and its depolymerizing enzyme, hyaluronidase. This imbalance has been attributed to either a decreased production or inactivation of the enzyme, or to an increased production of the mucin.^{40, 44} Thus, in any way, the end result would be an excessive accumulation of hyaluronic acid in the tissues.

Although hyaluronidase is known to have other mucinous substrates, it is unlikely that chondroitinsulfuric acid is one of these.²⁵ Consequently, it would be difficult to explain the elevated quantity of this substance on the basis of a deficiency of the enzyme mentioned.

The presence of greatly increased numbers of mast cells in the myxedematous areas may be of significance in supporting the theory of increased mucin production. This is presented in light of the fact that the mast cell has been demonstrated to be a site of origin of hyaluronic acid.² Such factors raise the possibility that this cell may receive its stimulus to proliferate and secrete from E.P.F., as does the thyroid cell from T.S.H. On the other hand, this again fails to explain the excessive accumulation of chondroitinsulfuric acid.

Actually, so little is known about the biological relationships and metabolism of the mucopolysaccharides that additional speculation would be difficult and unfounded. Thus, the mechanism whereby

the pituitary may effect the local disturbance of metabolism of these substances seems destined to await further discoveries in this field.

Another feature of localized myxedema not yet explained is its proneness to occur in some body parts yet never affect others. A few authors have attributed this to local injury from such previously existing factors as circulatory stasis, trauma, and edema of the affected areas, but evidence for this is not at all conclusive.^{7, 23, 38} Nevertheless, there seems to be some unknown local element which renders the chosen areas more vulnerable to the process. Perhaps the often noted sparsity of elastic tissue may represent a predisposing rather than a consequential factor in this disorder.

The concurrent development of clubbing of the fingers with localized myxedema and exophthalmos may also be attributed to pituitary dysfunction in the form of an overproduction of growth hormone. This hypothesis is upheld by Levitt's demonstration, in such a case, of a marked hyperplasia of the eosinophilic cells of the anterior pituitary, the accepted site of origin of the hormone. If true, this may explain the roentgenologic features in our case and the facial characteristics of acromegaly in a case reported by Sunseri. Acromegaly is a disease evoked by hypersecretion of this substance. Thus, the manifestation of these features in association with localized myxedema and exophthalmos merely implies a close relationship between the growth hormone and the pituitary-thyroid axis. It also serves to exemplify the complexity of endocrine interrelationships as a whole and their intricate nature of balance in the normal state.

In light of this discussion there are many features of localized myxedema which are not yet clarified. Nevertheless, there seems sufficient evidence to indicate that it is no isolated phenomenon and is intimately related to a complex mechanism of endocrine activity affecting primarily the pituitary-thyroid axis and to a lesser extent its relationship to the adrenals and gonads, all in association with variable local factors.

Diagnosis: The prime factors in the diagnosis of this entity are to be aware of its existence in hyperthyroidism and to be familiar with the various skin manifestations in its course of development. Because of a general lack of this knowledge, the process is often overlooked entirely or mistaken for some more commonly known condition. The initial pitting edematous change is frequently confused with edema of cardiovascular or renal origin. Early erythematous lesions may simulate those of erythema nodosum; however, the latter are usually acutely painful. It may also be similar in appearance to erythrocyanosis (pernio) which is a red pruritic swelling of the lower legs

caused by exposure. In its more advanced stages the nodular infiltrates may be confused with amyloidosis cutis.

Farther advanced diffuse non-pitting states with thick leathery skin may resemble local involvement by scleroderma, scleredema, or chronic lymphedema. Each of these can usually be differentiated from localized myxedema by its other manifestations and history of development. Nevertheless, any of these conditions may coexist with hyperthyroidism when localized myxedema may be absent. In such an instance where there may be confusion, the ultimate diagnosis would rely upon biopsy studies of the local lesions.

Treatment: At present there is no specific mode of therapy which can be consistently relied upon to alleviate this condition. Many different methods have been tried but with little uniformity in results obtained. One of the earliest methods used in severe cases consisted of surgical excision of the local areas followed by plastic repair.^{28, 43} This admittedly reduced the extent of the lesion but usually resulted in large hypertrophic scars at the operation site.

A more recent local approach is the injection of hyaluronidase into the myxedematous lesions. This is done in an attempt to depolymerize the excess hyaluronic acid in the tissues and thereby permit diffusion of the fluid from the skin. Immediate and spectacular results have been hailed by some advocates of this therapy.^{15, 35, 36} However, other reports in which the cases were adequately followed indicate this is only a temporary improvement, as was evident in our trial of such injections.^{18, 31}

Several forms of systemic therapy, mostly hormonal, have also been used to combat localized myxedema. These methods, most of which were instituted in an attempt to correct the endocrine imbalance causing the disorder, have also elicited extremely variable results. Exogenous thyroid extract, thyroxine, and iodine have been given by many without benefit.^{18, 28, 30, 31, 40} Only one favorable result has been claimed from thyroid administration alone, and another when it was given in conjunction with propylthiouracil and stilbesterol.^{16, 41}

The local injection of thyroxine was reported in favorable light by Goldner, but this was not substantiated by the work of Trotter and Eden. The effect of estrogens is equivocal but seems to be of some benefit especially in the treatment of localized myxedema in postmenopausal women.^{23, 42} Cortisone and ACTH, by parenteral, oral, and local administration, have produced both favorable and unfavorable results in the hands of various investigators. However, most evidence indicates that these hormones elicit only partial and temporary improvement in early cases and have no effect on advanced lesions.^{18, 20, 27, 31, 45, 46}

A more direct attempt to eliminate the causative elements of this syndrome is that of diminishing pituitary hyperactivity by irradiation or cauterization of the gland. The effects of these procedures on the lesions of localized myxedema have been observed mainly as a by-product of the treatment of coexisting malignant exophthalmos. Excellent remissions of both lesions with this type of therapy have been reported; however, the response of localized myxedema has been the least predictable.^{3, 4, 13, 18, 26} This is probably due to an irreversible state of the lesion when treated. The presence of such a state is apparently the reason the leg lesions in our patient stopped progressing but did not regress as did the less advanced lesions of the hands, after hypophyseal irradiation.

Obviously cauterization of the pituitary is an extremely radical procedure which has few if any indications, even in the treatment of severe progressive malignant exophthalmos. However, the dose of irradiation necessary for controlling cellular hyperactivity of the pituitary has been shown to be much smaller than that capable of disturbing the function of normal cells. Thus, with careful administration such therapy has proved to be relatively innocuous and evokes no undesired side effects on other functions of the gland.¹³

Because of this feature, Gedda and Lindgren have successfully used and strongly advocate pituitary irradiation, rather than surgery, radioactive iodine, or antithyroid drugs, as the first line of attack against hyperthyroidism in which the development of progressive exophthalmos is anticipated. Thus, it should be equally advocated in situations where localized myxedema is an initial feature. This is because the presence of such indicates a hyperpituitary type of thyrotoxicosis and may serve as a warning that progressive exophthalmos is incipient, if not already present, or that both lesions are apt to exacerbate following the ordinary methods of suppressing thyroid activity.

In general, the evaluation of any of the above methods of treatment is extremely difficult because of the inconsistency of various results encountered. This is further complicated by the self-limited, yet unpredictable, nature of the lesion which has often been found to regress spontaneously after it had failed to respond to therapy.^{20, 28, 30} In light of this, some favorable results obtained may actually represent such a regression which would have occurred whether or not treatment was instituted.

On the other hand treatment, which at the time appeared to be a failure, may have triggered a readjustment of the endocrine mechanism and thereby aided in a subsequent remission of the syndrome. Furthermore, several unsatisfactory results may have been acquired from futile attempts to combat ir-

reversible lesions. Thus there is much room for argument concerning which path to take in attempting to alleviate this condition.

The most logical approach would seem to be that of prophylaxis. Therefore, the thyroid should not be treated directly in a case of hyperpituitary thyrotoxicosis that presents early manifestations of localized myxedema and exophthalmos. This is because of the danger of increasing pituitary dominance and further exacerbating the lesions. In such an instance hypophyseal irradiation would appear to be the treatment of choice. However, when the lesions do not develop until after the initial treatment for hyperthyroidism, the pituitary dominance is commonly less severe and more transient than in the above situation. Here the practical approach would appear to be the institution of systematic hormonal therapy in conjunction with elastic wrapping of the involved extremities. This is done in an attempt to hold the process in check until such time as it stops progressing or undergoes spontaneous involution because of a readjustment of the endocrine mechanism.

On the other hand, if the above method fails and the lesions progress rapidly toward an irreversible state, or if there are indications that an associated severe exophthalmos may develop, pituitary irradiation should again be considered.

SUMMARY

A typical case of localized myxedema occurring in association with hyperthyroidism is presented. The process involved both upper and lower extremities and exhibited coexistent development of clubbing of the fingers. Roentgenologic characteristics of acromegaly were also present.

A study of general, sex, and age incidence is included.

Clinical features, histology, pathogenesis, diagnosis, and treatment of localized myxedema are discussed.

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BOOK REVIEWS

Clinical Pathology—Application and Interpretation. Second Edition. By Benjamin B. Wells, M.D. Published by W. B. Saunders Company, Philadelphia. 488 pages, 25 figures. Price \$8.50.

This is a valuable book in the library of a practicing physician as it deals entirely with the uses and interpretation of various laboratory tests and their help in making a diagnosis.

The chapter on infectious diseases discusses various tests to be used, cultures, blood tests in various viral diseases, rickettsial diseases, parasitic diseases, and bacterial diseases, both common and uncommon. The chapter on metabolic and endocrine diseases and the tests applicable is ample and well written. Too there is good coverage of laboratory tests used in surgery, obstetrics, cardiovascular disease, blood disease, and kidney disease.

The book is recommended to the busy physician.
—J.L.L.

Diseases of the Breast. By C. D. Haagensen, M.D. Published by W. B. Saunders Company, Philadelphia. 751 pages, 404 figures, 25 charts. Price \$16.

"Chock full of almonds" best describes C. D. Haagensen's *Diseases of the Breast*, a new first edition of carefully integrated anatomy, physiology, diagnoses, and treatment of diseases of the breast. It has an excellent author and subject matter index. It is better than most treatises in that it covers the subject quite exhaustively and yet leaves out the tiresome

verbiage of little practical use found so often in a book of this kind and size.

The author's rich experience permits him to write with authority. The section on the lymphatic drainage and pathways is well done. The chapters dealing with the non-malignant conditions are particularly helpful, especially in the discussion of cystic disease. Relatively new concepts and the development of adenosis and ectasia are interesting and informative, as well as helpful in differentiating from malignant conditions. Material on differential diagnoses is excellent. Postoperative edema of the arms is well explained.

Again, extensive experience permits the author to develop an absorbing and thought provoking chapter on the natural history of breast carcinoma.

While the author covers radiation and hormone treatment of carcinoma of the breast, the reader feels he leans toward radical surgery as the main treatment.

This is a well balanced volume and should be of great value to the general practitioner, surgeon, and gynecologist alike.—G.E.K.

Management of Emotional Problems in Medical Practice. Edited by Samuel Liebman, M.D. Published by J. B. Lippincott Company, Philadelphia. 152 pages. Price \$5.00.

This small book comprises the publication of individual talks delivered in a lecture series at the North Shore Health Resort in Illinois by nine well known physicians interested in psychiatry. It is a useful presentation to the general practitioner of medicine of the psychiatric viewpoint of commonplace psychological phenomena seen in the everyday practice of medicine. Being multi-authored, by men of somewhat different disciplines, backgrounds and viewpoints of psychiatry, it does lack continuity, and it presents the average practitioner with somewhat conflicting views of the understanding and management of the same psychological phenomena. By the same token, however, such an edition is informative in describing the many facets of disciplines currently available for the management of psychiatric illnesses.

This volume will be a disappointment to the practitioner looking for a handbook of simple tricks in the management of involved psychiatric problems. It would be interesting and useful to the individual seeking further understanding of psychiatric problems and the views of current psychiatry in managing them.—J.A.S.

Handbook of Pediatric Medical Emergencies. Second Edition. By Adolph G. DeSanctis, M.D., and Charles Varga, M.D. Published by C. V. Mosby

Company, St. Louis. 389 pages, 73 figures. Price \$6.25.

This handbook is well indexed and covers the field of pediatric emergencies. It should be most valuable for physicians in general and pediatric practice.

The section on poisoning is extensive and gives concise descriptions of the signs and treatment of each type of intoxication. The appendix gives a complete list of commercial sources of most poisons with a page reference for signs and treatment in each instance.

A complete series of tables furnishes a listing of normal physical and chemical constants.

The chapter on pediatric procedures is well organized and presented in concise detail. The section on drowning is somewhat oversimplified and too lengthy.

The first edition of this handbook has been translated into Spanish, Turkish, and Hebrew and created such demand throughout Europe and the United States that this second edition was printed.

This text is well written with directions and methods of therapy which are based on orthodox pediatric principles. The handbook answers most questions which could arise as pediatric emergencies. In some instances the procedures directed would actually be life saving.

The book should be of inestimable value as a quick reference for physicians caring for children.—D.R.D.

British Medical Bulletin, Volume 12, No. 2, Neuro-Otology. Published by Oxford University Press, New York. 90 pages. Price \$2.75.

This book is a comprehensive study of the entitled subject. It is divided into component parts by which it is studied.

The first component deals in great detail with the method of sectioning the temporal bone. The development of this procedure has made possible the study of both diseased and normal tissue that is otherwise impossible due to the anatomical fact that it is difficult to make a detailed study of this part in the living subject.

The next several parts are of particular interest to researchers more than to clinicians. The formation of the labyrinthine fluids, electrophysiology of the central auditory pathway, and the comparative physiology of the otolith organs are of importance to determine how these organs function but are of little value in making a clinical diagnosis.

The following four sections have some duplication in dealing with hearing and vestibular function. Loudness recruitment is well discussed. Fatigue and adaption are rather lengthily discussed, and it is

found that the hearing nerve functions about the same as other cranial nerves.

The portions of this bulletin that deal with surgery and organic eighth nerve affection are of more clinical value than most of the remainder of the articles, i.e., Hereditary Lesions of the Labyrinth in the Mouse.

This, as are most British articles, is well written and gives a good symposium on neuro-otology, but it is so technical in places that it is difficult reading.—R.R.P.

Roentgen Signs in Clinical Diagnosis. By Isadore Meschan, M.D. Published by W. B. Saunders Company, Philadelphia. 1058 pages, 2216 illustrations on 780 figures. Price \$20.

Practicing physicians and residents in radiology or any other medical specialty must constantly organize their thinking in terms of differential diagnoses. This textbook is one of few which does it for you. A busy practicing physician should be able to gain pertinent information from a roentgenological standpoint in a short time from this textbook.

The illustrations are especially good since they include a good radiograph accompanied by a diagrammatic drawing with excellent labelling of the parts.

As one studies a radiograph of a bone, he may see a punched-out area of radiolucency. If he has any basic knowledge about bone radiography, he immediately realizes that there are several entities that can produce this picture. The authors have listed these findings in well organized chapters with headings such as "Osteosclerotic and Hypertrophic Bone Disease." Other chapters on the chest and the gastrointestinal and the genitourinary tract are treated in a similar manner of presentation.

The first two chapters of the book deal with some fundamentals of radiographic technique and on protection from roentgen irradiation. Three-fourths of the book deals with the skeletal system and the chest. The gastrointestinal and the genitourinary tract are illustrated with only the pertinent findings and signs. One entire chapter is devoted to the radiography of the heart, which is covered well for so complex a subject.

In addition to the roentgen signs so completely illustrated there is a discussion of roentgen techniques used in demonstrating a certain sign, picture, or condition. This should be helpful for any physician when deciding what views he should order.

This text is highly recommended to the radiology resident. It is an excellent reference manual for physicians in all the specialties but especially for the orthopedist, internist, and general surgeon.—D.M.M.

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Hazards in Low-Protein Diets

Repeated warnings against use of low-protein diets, made popular recently by publicity in the lay press, have been issued by the American Medical Association in the form of articles in the *Journal* and in news releases. Physicians have pointed out serious hazards that had not been made clear in nonmedical publicity about the so-called "Rockefeller" or "fabulous formula" diets.

Although many lay magazines have carried data on weight reduction diets, most attention has been centered on articles which appeared in *Look* magazine and *The Ladies Home Journal*. The diets reported there differ from both of the most common—those which call for low-calorie consumption but balanced nutrition and those requiring drastic cuts in fats, sugars, and starches and increases in proteins. The new diets call for lowered protein intake.

One diet, called "peasant diet," "crash diet," or "fabulous formula," is a liquid combination of corn oil, evaporated milk, and dextrose. At least one Topeka hotel featured the formula on its menu shortly after the magazine publicity had created a demand. The other diet uses regular food but includes items containing little protein.

"The protein content of either diet is below minimum requirements for a normal individual," said the Council on Foods and Nutrition of the A.M.A. "Anyone remaining on the diets for long could suffer protein deficiency, its accompanying nitrogen imbalance, and the resulting serious injury to body tissue. In addition, the diets are woefully inadequate in amino acids and iron."

To safeguard the health of dieters the A.M.A. recommends that all who wish to reduce weight do so under the guidance of a physician.

Research Grant to A.C.P.

A research grant of \$43,100 has been awarded the American College of Physicians for the period September 1, 1956, through August 31, 1957, by the Department of Health, Education, and Welfare of the Public Health Service in furtherance of its project to evaluate internal medicine in hospitals. This project, "to establish a minimal standard of quality and efficiency of the practice of internal medicine in hospitals," was initiated in early 1956 by

the college's Committee on Criteria for Hospital Accreditation.

A pilot study of approximately 100 representative hospitals is being conducted by observing practice methods with particular reference to internal medicine. Twenty or more mature and responsible physicians are being sent to selected sites to observe current practices; to record the type of patient admitted to a hospital, the diseases, length of stay and the means employed for diagnosis and treatment; and to classify findings—viz., approved, provisionally approved, and not approved.

A search is being directed to the mechanics of internal medicine as practiced in a wide variety of circumstances (large, small, voluntary, tax-supported, private, teaching or non-teaching institutions), especially the use of clinical laboratory devices; habits of consultation, and use of ancillary skills such as physical medicine, rehabilitation, preventive medicine, and others. Such observations and records will be edited by the director and reviewed by the Committee on Criteria.

Although appraisal of medical care will be the primary objective, information will be gathered also regarding internships and residencies in medicine where such programs exist. Close liaison will be maintained with the Council on Medical Education and Hospitals of the A.M.A. and the appropriate committees in the Association of American Medical Colleges.

Medico-Legal Films Available

A series of films on medico-legal problems will be produced by the pharmaceutical firm of William S. Merrell Company of Cincinnati in cooperation with the American Medical Association's Law Department. The first film—dealing with the doctor as a medical expert witness—was previewed in November at the A.M.A.'s clinical session in Seattle. This film will be available for showings at state and county medical society meetings after December 15.

The first year class at the University of Kansas School of Medicine this year numbers 104 students. Of this number, three are foreign students and six are women.

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"Biggest Bargain in History"

Medical care in the United States today is "the biggest bargain in history," in the opinion of John A. MacCartney, president of the American Pharmaceutical Association. He made the remark recently in an address before a combined meeting of the Pharmaceutical Advertising Club and the Rutgers University Pharmacy Extension Course.

"The total cost of illness in terms of medication, medical care, and, most importantly, the loss of time and income to the sufferer and his family, has been so sharply reduced as to make any comparison with past years almost ridiculous," he said.

MacCartney added that if cost-per-dose is the only criteria used, then the treatment our forefathers received was far cheaper than is the case today. "But," he explained, "if we compare the end result of modern medicines with those of the past, we find a startling and happy reversal of the situation."

MacCartney, who is professional relations manager for Parke, Davis and Company, also commented on pharmaceutical manufacturing.

"It is the only industry in the world which is furiously engaged in a continuous effort to work itself out of business," he said.

"By this, of course, is meant that the astonishing progress we have made in the control of many diseases has made it possible to discontinue production of remedies formerly used."

MacCartney explained that as one serious disease is eliminated, the average person's life is prolonged to the extent that he is a "statistical probability for some other disease. We are in the anomalous position of being cured of one disease so we can live long enough to acquire another."

The Parke-Davis executive pointed out that the pharmaceutical industry in this country is well equipped to meet "the productive challenge of today's health demands and to anticipate those of the future."

Hospital Expenditures Rise

"In United States hospitals of all types, expenditures per patient day rose 116 per cent in the last ten years, and in the non-profit short-term general hospitals the rise was 141 per cent," reported the American Hospital Association recently. Expenditures per patient day in hospitals of all types rose from \$5.21 to \$11.24 between 1946 and 1955, while expense per patient day in the non-profit short-term institution increased from \$10.04 to \$24.15.

"Hospital care has become more expensive as it has offered more diversified services for treating and

caring for patients," said Mr. Ray E. Brown, president of the hospital organization. The increases also reflect the rise in payrolls and the higher cost of supplies and equipment, he said.

Other ten-year trends include:

The over-all increase in the number of hospital beds was 168,630, or 12 per cent. A 20 per cent bed increase was reported in non-federal short-term hospitals, while the number of beds in non-federal psychiatric hospitals increased more than 24 per cent. There was a 22 per cent decline in the total number of beds in hospitals operated by the federal government.

Annual admissions rose steadily during the period. There were 5,397,919 more admissions in 1955 than in 1946, an increase of 34 per cent.

The average daily census for all hospitals in 1955 was 221,160 more than the average for 1946, a rise of more than 19 per cent.

Medical News, the first national-circulation newspaper published expressly for physicians, marked its first anniversary September 10 with a special 12-page issue. Sponsored by Ciba Pharmaceutical Products, Inc., the newspaper goes to more than 94,000 physicians, all of whom have requested it.

Fourteen hundred Kansans died from accidental causes in 1955, according to the Kansas State Board of Health. While acute communicable diseases have gradually declined in importance until today they are no longer a leading cause of death, the record for accidents has not improved. In spite of safety education, accidents continue to kill nearly the same number of people year after year.

A recent survey shows most people save for the proverbial "rainy day." In the past four years, however, more and more people save with positive objectives in mind, such as buying homes and durable goods or providing for retirement.


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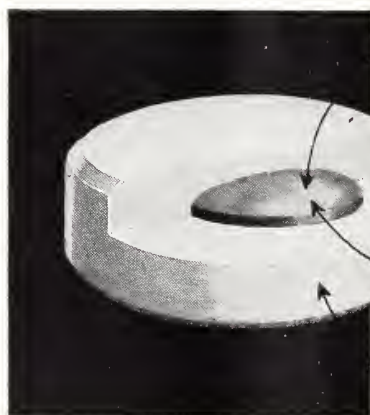
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